SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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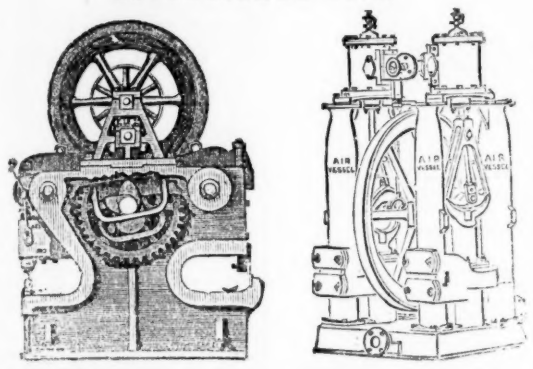

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PARIS, BRONZE MEDAL, 1867.

ORDER OF THE CROWN OF PRUSSIA.

FALMOUTH, SILVER MEDAL, 1867.

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the Geographical Congress, Paris, 1875—M. Favre, Contractor, having exhibited the McKean Drill alone as the MODEL BORING MACHINE for the ST. GOTHARD TUNNEL.

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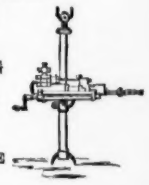

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4.—THEY ARE THE ONLY MACHINES THAT MAKE THE ORE CLEAN FOR MARKET AT ONE OPERATION.

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Mr. BAINBRIDGE, C.E., of the London Company's Mines, Middleton-in-Teesdale, by Darlington, writing on the 20th March, 1876, says—"The yearly profit on our Nanthead waste heaps amounted last year to £600, besides the machinery being occupied for some months in dressing ore-stuff from the mines. Of course, if it had been wholly engaged in dressing wastes our returns would have been greater: but it is giving us every satisfaction, and bringing the waste heaps into profitable use, which would otherwise remain dormant."

Mr. T. B. STEWART, Manager of the Duke of Buccleuch's Mines, Wanlockhead, Abington, N.B., writing on 20th March, 1876, says—"I have much pleasure in stating that a full and superior set of your Ore Dressing Machinery has been at work at these mines for fully a month, and each day as the moving parts become smoother, and those in charge understand the working of the machinery better, it gives increasing satisfaction, the ore being dressed more quickly, cheaply, and satisfactorily than by any other method."

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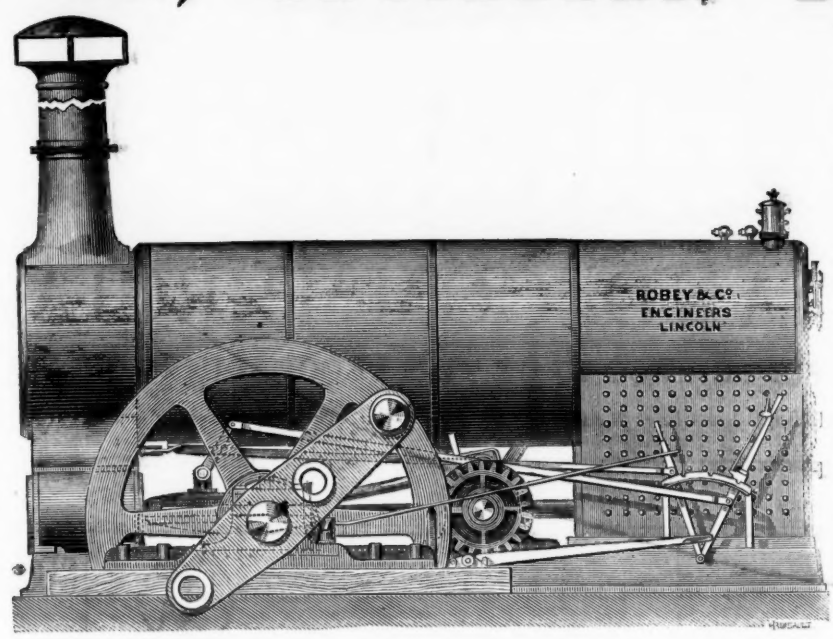

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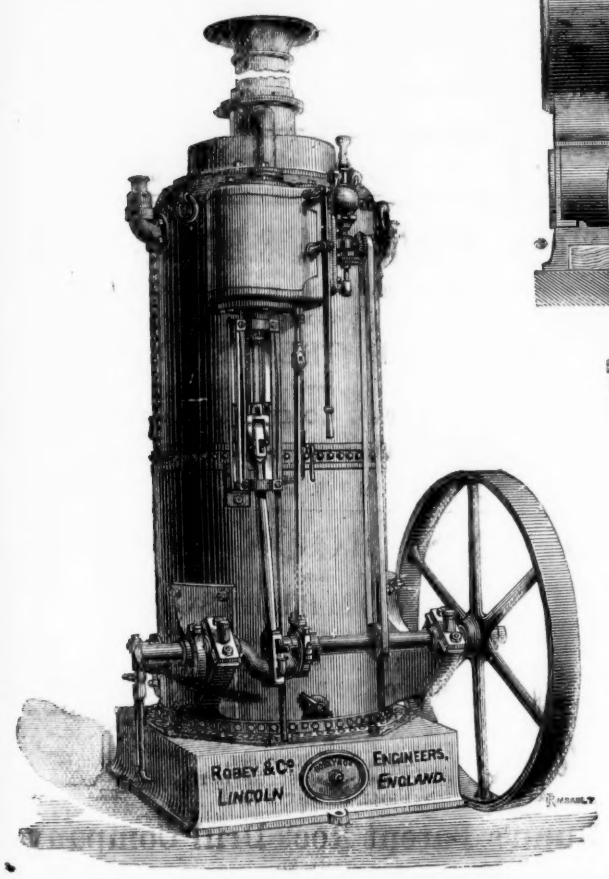

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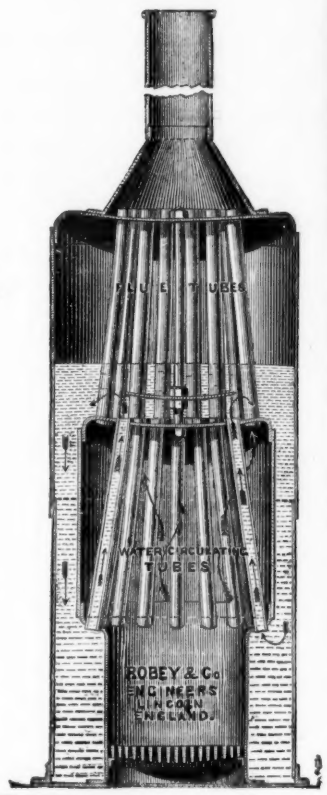

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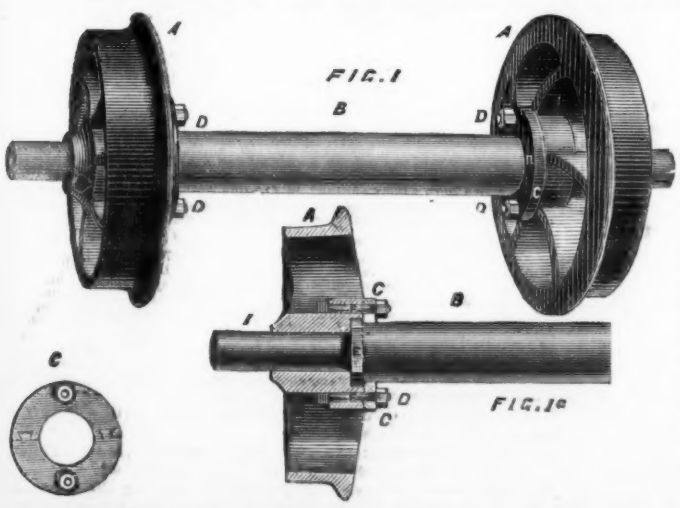
CRUCIBLE CAST STEEL CASTINGS,

Sykes Works, Eyre-st. & Bridge-st., Sheffield. London Office: 118, Cannon-st., E.C.

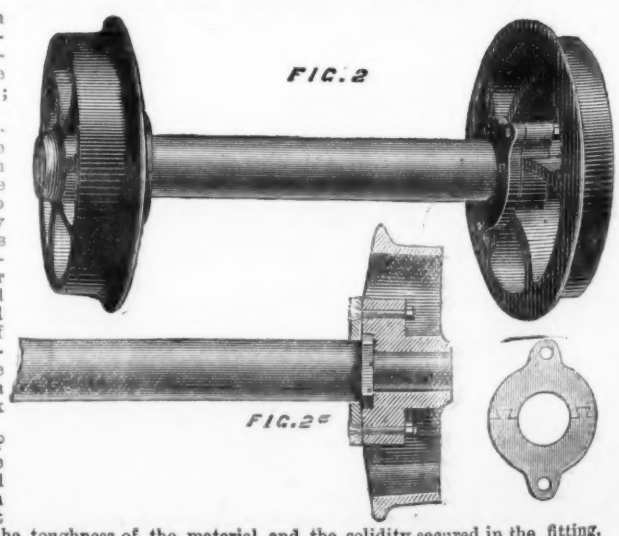
A New Patent Method of Fitting up Wheels and Axles.



Figs. 1 and 1a show a longitudinal view and plan of a pair of corf wheels and axles fitted up for outside bearings, and Figs. 2 and 2a for inside bearings. A A, are the wheels; B, is the axle; C C, the washers; D D, the bolts; E, the collar on axle B; and F, the recessed boss in the wheel.

The wheel is cast with a recessed boss in the inside, made to any shape, corresponding in shape and depth with a collar formed on the axle, which is forged of solid steel; the axle is secured into the recess partly by being sufficiently tightly fitted to require driving home with a hammer, and partly by the washer. Around the axle adjoining the boss is fixed the washer, made in two parts and dovetailed, so as to allow of being fixed after the collar has been forged on the axle. The washer is secured to the boss by bolts and nuts, both in outside and inside bearings; in the case of inside, by means of lugs cast on the boss, and the washer made of corresponding shape; the washer is made of crucible cast steel. The only tool required for fitting is an ordinary spanner for outside bearings, and a box spanner for inside bearings.

Now what are the advantages of this method? You secure a simple way of fitting—it can be done by anyone who has seen it—the only tool required being a spanner; the wheels can be detached from or secured to the axle in a few minutes. The next advantage is the perfect solidity attained, the wheel and axle practically becoming as one piece. The durability results from the toughness of the material, and the solidity secured in the fitting. Another thing is the wheels do not need to be put in the fire to detach them, as is the case in ordinary wheels. (N.B.—Our wheels cannot be injured by being heated and plunged into cold water. which would render other steel wheels perfectly brittle as glass.) Saving in fuel and wages is evident—no skilled labour being required to refit wheels in case of a strained axle, By adopting this system colliery owners may save hundreds of pounds sterling yearly.



Original Correspondence.

NEW SOUTH WALES MINERALS—PARIS EXHIBITION.

SIR,—My former letter on this subject was a general one, and referred principally to the exhibits of our Government Mining Department; but there is also one by a private exhibitor which merits special attention, and Mr. Bensusan's valuable collection of metalliferous minerals, the produce of this colony, may be classed among the educational and scientific contributions from here. Embracing as it does the best representative specimens of all the valuable minerals found in New South Wales, it also possesses the advantage of being thoroughly classified, and conveying considerable information as to the *locales* of the mineral treasures; rare crystals, valuable to the mineralogist, which have occupied Mr. Bensusan many years to collect, are carefully described and arranged, some being unique of their kind. The catalogue embraces eight large show cases, besides some large blocks of tin and copper ores, weighing several hundredweights each. The minerals principally represented are copper, lead, antimony, bismuth, tin, graphite, manganese, gold, silver, mercury, zinc, molybdenum, iron, kaolin, steatite, iron pyrites, kerosene shale, some of the gem stones, &c. In addition to the metalliferous minerals, he has supplemented the collection with ingots, and specimens of some of the metals made in Sydney—copper in ingots, tin in ingots, grain, and bar, antimony in ore, crude regulus, and finest star; nickel in several forms obtained in the process of manufacture, from regulus containing 35 to 40 per cent., up to bars and shotty nickel ranging from 90 to 97 per cent., together with alloys for the electro-plate manufacturer. I understand that Mr. Bensusan, in connection with two of our leading metallurgists, has devoted a good deal of attention to this new industry, and hopes to perfect and start the manufacture on a commercial scale. The tin displayed is made at his (Mr. Bensusan's) "Kangaroo" Works; and the copper from his "Emu" Works is also represented. Metallic mercury, made in Sydney from the cinnabar of the Cudgegong Mine, discovered and opened by him some years since, is also shown; likewise rich platinum ore containing palladium and rhodium. His valuable collection of gem stones he sold recently to the "Commission," and they will be separately displayed by us.

The numerous medals which have been from time to time awarded to him for his carefully classified collections of minerals, gems, &c., as well as for his excellent metallurgical products, will be sufficient to recommend this collection to the notice of the scientific, and in its educational aspect it is of no less value, while its worth in a commercial sense is sure to be substantially recognised. One notable feature in this collection is the remarkable and peculiar condition in which some of the minerals are found, and their strange associations (some of which are probably new to science), for instance, taking gold we find it associated with quartz, calcareous spar, mispickel, pyrrhotim, iron pyrites, cobalt, copper, lead, titaniferous iron, ferruginous cement, ferruginous clay, granite, antimony, and in various other forms. So many years have been devoted by him to chemical investigations of these minerals that it has, in fact, become almost a speciality, and in the special information conveyed consists in a great measure the value of the collection.

The Commissioners have, I understand, been instructed to dispose of the collection (either by private sale or otherwise) after the closing of the Exhibition; so the man of science, the virtuoso, or the collector of curiosities, will each be able to gratify their respective tastes, and in so doing also help to more widely disseminate some knowledge of the varied resources of New South Wales, which our Commission, as a body, has worked so hard to see fairly represented at the Paris Exhibition. R. D. ADAMS.

Sydney, N.S. Wales.

MINING IN COLORADO—PARK COUNTY—No. V.

SIR,—Leaving Mount Bross, going south-westerly, the first place of prominence is Buckskin Creek, it forms a confluence with the River Platte, in the town of Alma, at the back of the smelting works; it is a deep ravine, bounded the greatest part of the way by lofty cliffs, composed of granite and gnesic rocks, which are capped by quartzite and limestone. In 1860 to 1863 it was the scene of active gold placer mining, and here was built the town of Buckskin, which at one time contained 2500 inhabitants; very little of it now remains except the foundations of the houses which mark the lines of the streets; crossing the valley are a number of very strong copper and lead lodes, all carrying both gold and silver. One of them, known as the "Phillips," is of immense width, and it was on the back of this, where the "free gold" laid, that about the time I speak of it became the arena of great excitement, and subsequently led to the opening up of the placer works all along the gulch; for a time a good deal of money was made, but the diggings appear to me to have been very shallow; there is no great depth of gravel, but what there was of it in the vicinity of the lodes was very rich in clean free gold. Several mines have been opened by adit levels, and several shafts sunk in the valley bottom, one of which is over 100 ft. deep; now the same fate attended these mines as those at Montgomery, 8 miles distant up the Platte; the miners only worked for gold, the ore being reduced in stamp mills or arrastres, both of rude construction. When the gossans ceased, which they generally do here below the water line, the ore became solid iron and copper pyrites, and although holding from ½ oz. to 2 ozs. of gold, and from 30 to 80 ozs. of silver, with 10 per cent. of copper, it could not be manipulated at a profit with the appliances then at command, and as at that period there were no smelting works in the country, one mine after another was abandoned. The practical miner in looking over this ground might wonder why it is not being worked, the lodes being so well defined and immensely productive; the reason is that other districts have been found in the county, where silver ores lie shallow. They can be worked without the aid of machinery, and as any of them which run over 100 ozs finds a ready sale at Alma, the miners can make good wages without the aid of outside capital, and, moreover, become the sole owners of the mines. But I think the time is not far distant when these argentiferous copper lodes will again be sought after, and if ever some good reduction works are erected in the valley, conducted on modern scientific principles, by a company provided with the necessary capital to carry them out on a large scale—say, 100 tons per day—old Buckskin will arise from her debris and, rejuvinated, grow into a magnitude the proportions of which her most sanguine early founders had no conception. This view of the case may be considered premature, but in a locality where there is such an abundance of copper, lead, silver, antimony, iron, and gold-bearing ores, with every facility for their easy and cheap extraction, wood and water sufficient for all purposes, good roads of an almost level grade, comparatively cheap labour, and a railway now in course of construction into the park, sooner or later it must become the locasis of a great metalliferous industry.

ALMA, a town of about 200 houses, at the entrance of the valley, has a smelting works of about 20 tons per day capacity; it is conducted by Mr. Henry Williams, of Cornwall, and is a great success. Capt. Groes, of St. Austell, has a concentrating works; it can be driven by water-power, but as the streams freeze up in winter steam is the motive power applied. There are two sampling works, one by Messrs. Myers, of the St. Louis Smelting Company, and a new one belonging to the Golden City Smelting Company, under the direction of Mr. W. F. Kendrick, their assayer. The respective agents of these companies are ready purchasers, for cash, of all ores of value that are brought into the town. The traders are liberal in the price of their merchandise. The St. Nicholas and Snowy Range hotels are well conducted establishments, while their charges are exceedingly reasonable; the same applies to the livery stables, where horses and mules trained to clamber the mountain steeps may be had. There are the usual number of saloons and restaurants, two churches, and one public school; the altitude is about 9500 ft. above sea level; the winters are long, but not very severe, a mean of three months will scarcely touch 12° Fah.—only twice has it been down to 16° below zero; the air is pure, water good, snow not very deep, and all the inhabitants social. There is one weekly newspaper, the Mont Lincoln News; one gaol, that has long been without a tenant. The town can boast of not having a policeman or a lawyer within its corporate limits—such is Alma, the centre of the great silver district of Colorado.

CHARLES S. RICHARDSON, G.M.E.

Alma Museum, Colorado, April 24.

[*To be continued.*]

THE GOLD MINES OF MINAS GERAES, BRAZIL.

SIR,—At a time like the present, when the depression in mining is unparalleled, when capitalists cannot find places at home to invest their money with a good prospect of success, and the poor working miner can no longer earn a fair day's wages for a fair day's work, it is gratifying to see an influential capitalist like Mr. Gordon recommending to the public, and himself offering to take a substantial interest in the gold mines of Brazil. The price of tin and copper has become so low as to render the richest of the mines in which those metals are found of little or no value, but gold always maintains its value, and it appears to me that gold mining is the only undertaking which has not suffered financially during the depression of the last three or four years.

I have had considerable opportunities of examining the gold mines in almost every part of the world, and I make bold to say there is not another country known presenting the same favourable prospects for gold mining as the province of Minas Geraes, in Brazil. It must not be expected that all the gold mines discovered there will be equal to the celebrated St. John del Rey, the Gongo Soco, and others of a similar character—those are exceptions to the ordinary run of paying mines. I have no doubt the St. John del Rey is capable of paying 20 per cent. per annum for 50 years or more on a capital of 500,000*l.*, and as for the Gongo Soco the amount of gold taken out of that mine can never be known, inasmuch as the quantity reported to have been stolen amounted to tons. But although mines like the Gongo Soco and the St. John del Rey may not be numerous there are hundreds of mines now idle in the province of Minas Geraes which are capable of paying 20 per cent. per annum on a capital of 20,000*l.* and upwards, but in order to insure success it is absolutely necessary that the managers who are appointed to explore them should be thorough good miners, industrious, and economical, for nothing is more prejudicial to the interests of a young company than the appointment of incompetent and extravagant managers, who frequently commence operations by appointing a large and unnecessary staff of officers, by making a great show at surface, and erecting fine houses for themselves, and in short paying far more attention to their own personal comfort than to the interests of the company they represent. This is not imaginary, as there are several cases fresh to my mind in which good mines have been abandoned and companies ruined entirely from the cause I have referred to.

I am glad to see there is an improvement in this respect in the mines of Minas Geraes, and it is rather significant that the whole of the mines now working by English companies in that province are on the dividend list. It may be remarked that the Rossa Grande is on the non-dividend list, but this property is not being worked at present. I notice that persons generally speak of this property as one mine, but the Rossa Grande is an extensive property, containing several mines having no connection with each other, the Bahu Mine, recently recommended by Mr. Gordon, being the one to which the company confined their latest operations. The Bahu Mine was commenced to be reopened by Mr. Hilcke about seven years ago. He then informed me that he should soon be able to make it pay good dividends, but for some cause which I could never ascertain Mr. Hilcke soon after left the Rossa Grande Company. But I have heard many persons express their belief that if he had remained to carry out his own ideas the Bahu Mine would have paid satisfactory dividends long before this. This mine in itself is a small one, but I maintain that if it be judiciously managed it is capable of paying over 20 per cent. per annum on a capital of 20,000*l.*, but in order to do so the manager must be a thoroughly practical man, embodying in his own person all the offices necessary for properly conducting the concern.

The general body of ore at the Bahu is of fair quality, and the line frequently yields patches of unusual richness; and here I would like to impress on the minds of all those connected with Brazilian mining that when those rich deposits are met with it is absolutely necessary to exercise the utmost vigilance in order to prevent the gold from being stolen, inasmuch as to my own knowledge the most inconceivable means are adopted by the natives and negroes for the purpose of appropriating all the free gold they meet with to their own use. In forming a rough estimate of what the Bahu Mine is capable of doing I arrive at the conclusion that with a monthly expenditure of 700*l.* the company can get a monthly yield of 3000 oitavas of gold, or (say) a profit of 500*l.* per month. In arriving at this conclusion I have allowed 10*l.* per month for English miners, and 4*l.* per month for natives. Thus it will be seen that not only can capitalists earn a fair percentage for their money but the poor working miner can earn sufficient to enable him to put aside something for a rainy day. As I before stated there are hundreds of mines in the province of Minas Geraes as good as the Bahu, and there are some richer and much more extensive, and as most of them can be got hold of for a mere song I strongly recommend capitalists to turn their attention in the direction of Minas Geraes as a safe and profitable place for investment.

Truro, May 14. A CONSTANT READER.

AN EXAMINATION INTO THE POSITION AND PROSPECTS OF CERTAIN MINES, No. V.—RIO TINTO.

SIR,—The introduction of this property to the public in 1873 naturally caused much interest to be taken in it from its magnitude as a mining adventure, and also because of the enormous capital required to work it. No mine either before or since this one was brought out has been introduced to capitalists with such pretensions. It was apparent from the first that there could not be immediate profit to the shareholders while the heavy expenditure for new works and the cost of purchase were being discharged. Had the public guessed that debts instead of dividends would be the fruits of their labours during the first five years, there can be no question that not one penny would have been originally subscribed. The disappointment which the shareholders of this concern have experienced is not of a temporary but rather of an accumulative character, and from appearances is likely to continue as such. Time was when the prospect of a dividend was held out, and even specific figures were hung before the eyes of the shareholders, but things are changed, and diffidence on this point has taken the place of confidence, so that the Chairman at one time says, when reminded of the promise of a dividend, "that it must have been in a weak moment that a specific amount was mentioned," and now "a small dividend" looms in the distance.

But to begin at the beginning. The Rio Tinto Company (Limited) has a registered capital of 2,250,000*l.*, in 10*l.* shares; it had at its formation an experimental work before it, for such it was in every sense of the word, for the mine previously had been worked at a heavy loss. The estimated expenditure for the first three years was 2,737,000*l.*, but beyond this there was the balance of purchase of 2,695,000*l.*, and the balance of promoters' charge of 600,000*l.*, so that the liabilities, immediate and prospective, amounted to 6,000,000*l.*, with assets in the shape of capital, subscribed and unsubscribed, as before named. This is not the general way in which mines are brought out; it is certainly novel, but at the same time a dangerous course for the interests of the shareholders. No mine burdened with debt can be expected to become profitable to the shareholders until the debt is discharged. No sooner was this company floated, as much as it was possible to float it, for the public only subscribed 1,710,000*l.* out of 2,000,000*l.* issued, than the "financial necessities of the Spanish Government" were brought under the notice of the company, and "these led to various proposals to the company to anticipate the nine subsequent payments by way of discount." The engagement with the Spanish Government was to pay 385,000*l.* a year for ten years for the mines; in all, 3,850,000*l.* The yearly instalment was large, and it may have been that the directors could not see their way clearly to fulfil this contract, and the easiest way out of it was to agree with the Spanish Government in its requests, and by this means gain an extension of time. Looking at the financial position of the mine, it is pretty clear that the company could not have continued its original payments. The profits were estimated at 835,000*l.*; rather a wild estimate it must be admitted when it is remembered that the mine had been working at a loss, and the mineral was generally acknowledged as poor; besides this, the calculation was based on a sale of 500,000 tons of ore for the year, when it was a fact that the annual consumption of pyrites at the time was reckoned at 520,000 tons only. I do not pretend to say that the calculation was intentional in its misleading nature, but there was certainly exhibited a want of care or else a total ignorance of the demand. Such calculations at once carry us in thought to those professors in America who have gained an unenviable reputation here. We blame them very much for having wilfully, we say, misled us in many of the schemes which they have reported on, but with our home celebrities we are more charitable, and think little of the errors of their judgment because we believe in them. The company has now been at work for five years within a few months. All its arrangements for facilitating the working of the mine have long been completed. Railway, pier, tunnel, and rolling stock have all been put into full swing, and yet what are the results?—a profit for 1877 of 185,000*l.* Tharsis, with a capital of 620,000*l.*, has paid since its formation in 1866 dividends to the amount of 1,546,134*l.*, and has a reserve and sinking fund of 110,124*l.* The dividend-paying mines, home and foreign, are princely undertakings in their results (bearing in mind their capital) as compared with what has been done at these mines. Had half the sum been expended on home properties that has been spent on this, they would have paid very handsome profits within the time this company have been struggling to pay the interest on the bonds. During 1877 a magnificent loss of 62,700*l.* has been made, and the difficulties are likely to increase, for the report repeats the every day noted fact—"the severe depression of general trade." The chemical trade is bad, and the copper market is in a serious condition, and there is a probability of the continuance of this state of things. Circumstances of this sort are beyond the possibility of calculation, but they in part only answer the deficiency of progress at Rio Tinto.

The accounts issued to the shareholders are unworthy a company like this. The mining public are accustomed to receive detailed accounts, but these are of the vaguest description. When the cost of administration in London and Spain, amounting to 33,335*l.*, is taken into consideration, it is only just to expect fuller accounts. The balance-sheet would have been more complete had a statement of the mining profit been rendered instead of the arbitrary fashion which it has been dealt with by the summary statement that a profit of 185,000*l.* had been made. I presume that statement could only be arrived at by an account being kept in the company's books; it would not then have been a difficult task to have transferred it to the balance-sheet. It would have been interesting to have had details so that the profit per ton on pyrites could have been seen at a glance; as it is, the profits on the pyrites and the copper are lumped together, so that it is practically impossible to ascertain the fact. It is, however, pretty clear that the profit cannot be more than half the original estimate. Of the working expenses, whether extravagant or not, nothing can be said; there is nothing to give a clue to them. The accounts are simplified by being lumped. If the company wants a specimen of mine accounts, those of the Richmond Company are worth their studying; it must be said of them that there are no better mining accounts put into the hands of a body of shareholders. As the accounts now stand, the charge for interest on the bonds and loans cannot be less than 235,000*l.* a year. During last year the interest paid was 223,258*l.*, so that the interest payable is of an increasing nature. The floating debt of 1,297,000*l.* is rather an awkward looking item in the balance-sheet. It would be satisfactory to know whether these loans have a prior claim to the 5 per cent. bonds. In the event of foreclosure, and such a thing might come about, which would stand first?

There is at the present moment a feeling of misgiving as to what is to become of the Exchequer Mine in the minds of the shareholders of that mine, for in a circular issued by the directors it is stated—"It is, however, manifestly unwise to assume that the English bondholders will not ere long avail themselves of their right to foreclose, and thus obtain the entire property for the amount of their subscriptions." What may be done at Exchequer may be done at Rio Tinto. For a mine to have a debt in the form of bonds and bills hanging over it to the extent of 4,250,000*l.*, with an annual profit at the rate of 185,000*l.*, is to say the least of it a dangerous position, and should the payment of interest fall short the property would be as good as lost. The deficit on the interest account alone last year is equal to 55,000*l.*; as for the shareholders, they are shut out in the cold, and at the present rate of progression they are likely to be very much shut out. As for the "small dividend," they will be wise if they do not ask for it, and at the same time ask for cutting down as far as practicable the working expenses. Had any other mining company presented similar conditions to this there would long ago have been a committee of investigation to report fully and severally on the different departments. My impression is, from a perusal of the report, that the affairs of this mine are drifting into a state of hopelessness, and I can well understand one of the shareholders expressing his fear because of the deficit of 62,000*l.* on the last year's workings. Of the commissions earned by the promoters (and which are to continue as long as the company exists) on all sales of 1 per cent., and on all purchases of 2½ per cent., I shall say nothing but that it would be becoming to forego them until the mine is in a sound financial condition. It is so unusual for promoters to insert clauses of this character that it is surprising that more notice was not taken of it when the company was brought out.

As regards the development of the mine. From the fact that mining underground is not prosecuted to a great extent does it not suggest that the ore is not of such a rich quality in depth as in the shallower workings on the south lode, where the greatest attention has been given to the development of the property. The point of operation on the south lode was estimated to yield 11,000,000 tons of mineral, equivalent to 20 years' supply. Why, then, is such anxiety shown to open up the north and middle lodes at a time when the funds do not admit of more work being undertaken than is actually of a paying sort. The deposit on the south lode was estimated to hold out for 20 years, with an output of 500,000 tons annually, but at the rate of the present returns the estimated reserves ought to hold out not for 20 years, but for 40 years, and yet thousands of pounds are now to be spent in explorations on the north and central lodes. Surely there ought to be some further explanation than that of a "further view to prepare for the probable increase of demand for the company's ore." A probable increase suggests two ideas—first, that the company's ore may become richer, and, therefore, more marketable than at present, or that the demand may be expected from the revival of trade. Well, the increase in the consumption of pyrites has risen from 520,000 to 600,000 tons; in better times it would no doubt be more. When the company was brought out other companies appeared to be of little concern, because Rio Tinto would be able to sell their ores 3*s.* per ton cheaper than any other company. I suppose this course has not been attempted on a large scale. At all events, the idea of underselling has been abandoned, because "the directors have the satisfaction in reporting that a cordial understanding has been arrived at with the Tharsis Company and Messrs. Mason and Barry and other importers of pyrites, which cannot but prove very favourable to this company . . . . a limit has been put to competition which, while serving no real interests of the trade, was decidedly injurious to those of the importers." This is quite a different line of thought. Rio Tinto must have suffered, or this course would not have been followed.

Now, if a limit is put to competition it clearly shows that the supply at present must far exceed the demand, and this, too, while Rio Tinto is only bringing into the market 250,000 tons of pyrites a year. That the Rio Tinto ore is not rich is evident from the statement that to raise the percentage it was found necessary to select the ores, and although it was shown in 1876 that this plan was necessary, yet in the early part of 1877 it was not adopted. The sales of ore for this year are said to be 242,000 tons. The general reader might be mislead by this; although those sales have been made it does not follow that the ore was delivered. Some of these sales may have been made as far back as 1876, it being the custom to make

running and optional contracts for periods extending over one; two, or three years. To continue the tunnel to the middle and north lodes means an expenditure which must far exceed that of the great tunnel (and which took about three years to complete), as the distance from the opencast to the middle lode through the Cerre Colorado cannot be less than 500 metres, and the north lode 200 metres more. To undertake a work like this amounts to sheer folly just now unless, as I said before, it has become a necessity because of the poverty of the ore. But instead of continuing the great tunnel would it not be wiser to explore east and west of the opencast on the south lode? Is the south lode to be abandoned? If this is not the case why, then, undertake the work while the reserves are so large there?

"The earnings of the pier," whatever they may be, are expected to be "considerably enhanced" through an agreement with the Alicante Railway Company. There is not much hope of large profits in this direction. Rio Tinto is a mining company, and success must be looked for in this diriection if at all. It is like "catching at straws" to have a serious thought of making large profits from the pier; they cannot be large, and, therefore, of unimportant consideration. I trust the directors are not getting faint hearted about the profits to be made out of the mine, as they think it so necessary to draw attention to coming profits of the pier. The property is a pretty extensive one, covering 4710 acres, but not nearly as large as the rival company, Tharsis, with its 21,000 acres. Tharsis has been carried on with much spirit, and its great success is no doubt owing to its having works established in this country for the manufacture of copper and sulphur, and thereby being consumers of their own produce. Altogether during the present depressed state of trade I do not think there is an immediate prospect of the shareholders of this mine reaping much profit. Great economy and patience are necessary before anything substantial can be earned for the shareholders.

8, *Drapers' Gardens, E.C., May* 13. WILLIAM GABBOTT,
Stock and Share Dealer.

NEW QUEBRADA COMPANY.

SIR,—I must express my regret for the ambiguity of one or two of the remarks in my letter on the cost of working the Castillian furnace. I had intended to convey that the total cost of labour and material necessary to rebuild such a furnace so as to commence another campaign amounted to 38s. 6d. During 1877 were run at Maidanpek 126 campaigns, and the furnaces were reinstated at a total cost of 242*l.* 7s. 11d., whilst all other charges such as repairs to main pipes and flues, cleaning flues and canals, &c., were during the same time 107*l.* 19s. 2d. Such charges must be considered extremely moderate. The cost of roasting mattes at per ton of (wet) ore reduced was correctly stated at 8¾d.; speaking approximately the expense of roasting a 20-ton heap of mattes was—fuel and labour—five guineas. The amount of labour required to keep going a Castillian furnace for 24 hours will compare favourably with that necessary to work a reverberatory oven. It certainly has taken at Maidanpek six gypsies, but four good workmen would be sufficient. The 35*l.* is simply for the erection of the furnace and connection to main pipe; and, of course, includes no expenditure for smelting houses or blast machines. In the statement I gave of the reduction charges no administrative charges were included, but to show the total cost of mining and smelting a ton of ore I have divided the whole year's cost by the number of tons treated.

	Wet Weight.				Dry Weight.		
Staff, rail, charges, &c.	£0	5	2¼	.....	£0	6	11¼
Mining operations	0	6	3¼	.....	0	8	4½
Reduction charges	1	1	3½	.....	1	8	6
	1	12	9¼		2	3	9¾

I have included in the third item cost of transporting the copper bars to market.

I also neglected to observe that though the ores appear to me analogous in character there is a considerable difference in the percentage of the ores now reduced at Maidanpek and those of New Quebrada. The richest deposits at the former mines have been much worked, and thus the average value of the ores reduced during 1877 was only 4·12 per cent. These ores contained so much brown iron and kaolin that they were difficult to reduce, and required extra fuel. With ores which would easily run much less charcoal would do.

The sulphide of iron is added raw, but only in sufficient quantity to form a matte, because it is so slightly cupreous that its reduction would be attended with loss. The mattes drawn must depend in a large measure on the character of the ores. At Maidanpek it has been found disadvantageous to draw them over 22 per cent. With the New Quebrada ores a far richer metal would naturally be made, and as I observed in my former letter, any sulphides of 30 per cent. or any quartzose ore containing over 22 per cent. of copper sulphide can be run into bar copper after roasting. The Castillian furnace has been used in many foreign countries with great success, and is, I believe, largely employed for the smelting of the ores of the Cape Copper Company. I must repeat that I do not consider that any furnaces succeed so well in a foreign country, where forests exist, as the Castillian, nor that any furnaces can be put up so cheaply to reduce an equal quantity of ore. BRENTON SYMONS.

Fleet-street, May 16.

NEW QUEBRADA COMPANY.

SIR,—Our directors have at last deigned to give us a little information, but that in such a masterly manner as to leave the real truth as much at the bottom of the well as ever. It is not a deep well, but unfortunately, for ordinary mortals at least, the waters are very turbid. In the following remarks I shall not attempt reaching the real truth, as that for the present is unattainable, but I shall endeavour to place some of the facts in their naked deformity before the shareholders; and in doing so I would remark that I have never in any form or shape trafficked directly or indirectly in the shares of the company, and have never been interested in a single transaction on the Stock Exchange since 1866—the Gurney year. The few hundreds of shares I hold in the company were purchased by me in 1873 and have ever since been held without change, and I for one shall tolerate none of the gratuitous and impertinent nonsense that is so persistently (and of evil purpose as I believe) addressed to those who have the courage to impugn the conduct of our directors and the course of their administration, which are assuredly leading us, and that more rapidly, perhaps, than even they themselves are aware of, to our collapse as a company, and the total loss of our property.

I have now before me the accounts of Dec. 31, 1872, and those of Dec. 31, 1877, and so far as I shall deal with them for the present I shall deal with them in a way that any fellow can understand. Now, looking into these accounts and comparing them, I find as follows:—

I.—CAPITAL INDEBTEDNESS.

On Dec. 31, 1872, it stood thus—		
Shares issued—51,000 A shares		£255,000
2,454 B „		12,270
Total capital indebtedness		£267,270
On Dec. 31, 1877, it stood thus—		
Shares issued—51,000 (old)	£255,000	
15,000 (new)	75,000	
Debentures issued—330 8 per cent. ...	16,500	
400 10 „ ...	20,000=	366,500
Increased capital indebtedness in 5 years		£ 99,230

And this with apparently little or nothing to show for it.

II.—RECEIPTS AND EXPENDITURE.

	Dec., 1872.	Dec., 1877.
(1) Receipts—Cash from all sources ...	£273,983	£340,533
Deduct amount credited to shareholders of the old company ...	170,000	170,000
Net cash	£103,983	£170,533
		103,983
Cash received and expended in 5 years		£ 66,550
Loans and liabilities incurred as well...		40,302
Cash received and expended		£106,852

Leaving us as against the same assets in account, 4000*l.*! and, no doubt, large additional liabilities incurred since December.

(2) Expenditure—Cash expended by directors (exclusive of purchase money) up to Dec., 1872 ... £ 92,235
Up to December, 1877 197,135

Cash expended by directors in 5 years £105,800

Total copper produce from this expenditure, 738*l.*, and 1919 tons said to be afloat or arrived. Truly our money has shown a wonderful fox-like capacity of running to earth.

From the absurd and unbusinesslike form in which the accounts continue to be made out, it is difficult to get at the exact figures. But as regards (1) capital indebtedness; (2) cash receipts; and (3) cash expenditure, the above analysis gives an approximate idea of our directors' dealings during the past five years with this valuable property. The figures, without going into details, can scarcely be made to altogether tally; but in any way we like to look at them we are in a pretty considerable hole, and the directors have the courage to ask, in the face of such a gross waste of resources, for increased confidence at the meeting and further means to throw away.

Mr. Darlington has been home for more than a year now, and if he is the able practical man he is said to be why did he not at once propose a remedy, and get it put in force, instead of allowing cargo after cargo to be sent home, fit only to macadamise roads with? Suppose this mine had been his own, or even suppose the directors had said to him on his return—"Now, look here, Darlington, we will give you one-half of the profits if you will get us out of this mess, and enable us to pay a dividend"—would he have done nothing for 12 months but sit with his considering cap on? I trow not; and now when he and the directors are goaded into action, the latter lays this flattering unction to their souls—"We continue to be advised by Mr. Darlington."

We do not want his advice, particularly if it takes 12 months ere that advice can be got. We want practical, efficient, commonsense management, and this I am assured can be obtained, with capital as well, whenever the shareholders will arouse themselves from their present fatal stupefaction, and act each one as he would do were the property his own.

In their report there is not the slightest indication of the directors' programme or intentions. We have not even the slightest idea given us of the plans "very carefully matured by Mr. Darlington," which they told us in October last were before them; and, altogether, considering the urgent need of the company, a more ambiguous and unsatisfactory report was never presented to shareholders. The directors evidently expect that by a *coup* they will carry the shareholders with them at the meeting very much on Bismark's axiom of *beati possidentes*. But in this I trust they will find themselves mistaken, unless, indeed, they carry Matheson and Co. with them; and in that case, should eventually the concern come to grief, as on its present lines it appears bound to do, independent shareholders will have a good deal to say on the whole question.

London, May 16. O. K.

PATENT COMBINATION ROCK DRILL.

SIR,—In the controversy respecting rock-drills, which has raged in your columns for so long a time, several drills successful and satisfactory in their working have been discussed, but it would be a mistake to suppose that these include all the good drills in the market. We have been engaged in designing and making rock-drills for some years, and our conclusion has been that, subject to thorough efficiency, the qualities of cheapness and durability are of the first importance, and have been, perhaps, too often overlooked. Our drill has now had between two and three years work, and with recent addition and improvements we think that it justifies our statement in the three characteristics named—efficiency, cheapness, and durability—are to no small extent attained. Very many miners and engineers have seen it at work (including even the makers of other drills), and none have failed to give it the highest praise for simplicity of construction and management, with efficiency at work.

Southampton Buildings, May 15. EDWARDS AND CO.

ROCK-DRILLS—PROPOSED COMPETITION.

SIR,—I have read with a great deal of interest the letters lately published in the Journal from your correspondents "M. E." and C. Mackenzie, the former giving a list of what he considered the leading rock-drills of the day, and the latter describing the Eclipse drill, and the work he saw it perform. I was also much pleased to see the reply of the proprietors of the latter drill, in which they give a seemingly honest challenge to run both their drill and compressor against those of any or all makers in the world; it was a bold challenge to give, but shows they have the most undoubted faith in their machines. I have waited a fortnight to see if the challenge would be taken up (the more so when I remember the utter fiasco made by the Ingersoll Rock-Drill Company when their somewhat bombastic challenge was accepted by the Roanhead Drill Company), and am much disappointed at not seeing a single letter from anyone having even reference to it. Surely after all the crowing in the Journal some of the other makers of rock-drills must have confidence in their machines. If the challenge of Messrs. Hathorn and Co. be not taken up, I for one will certainly feel convinced that they are afraid to compete against that firm. It is high time the question of drills was settled; it is of the utmost importance to the mining interest that it should be, and I would, therefore, beg you to allow me to offer a suggestion—that some of the leading mining companies of the kingdom should subscribe a sum of money to be competed for by the owners of rock-drills, the rules and conditions of the competition to be drawn up by a committee chosen from their number, under whose immediate inspection the contest should take place, and, in addition, the owner of each competing drill to deposit some stipulated amount to be fixed by such committee, as suggested by Messrs. Hathorn and Co. This, I think, would meet the case, more especially when it is given out that drill makers not competing will be considered as not having sufficient faith in their machines to enable them to do so. GEORGE COOK.

Snaresbrook, Essex, May 15.

GEOLOGICAL MUSEUM—ABUSE OF PRIVILEGE.

SIR,—I think most of the readers of the *Mining Journal* will admit that at the Geological Museum in Jermyn-street we have one of the finest and most interesting collections anywhere to be found—admirably arranged through the liberality of the Government and of the executive, and open without fee or formality of any kind to all classes. That the privileges thus offered are appreciated by working men amongst others may be assumed from the large number constantly seen there, and to whom every attendant appears to be most obliging in giving information. Now, a well arranged and well conducted public museum should of all places of healthful intellectual recreation be exempt from the abuse of freedom offered, and it can only be a matter for congratulation that the disreputable societies, the servants of which are the offenders, are not likely to be benefited by their proceedings, which cannot but be regarded as contemptible.

Although the distributors of medical quacks' handbills have not yet commenced their business within the Geological Museum it may be anticipated that the time is not distant when such distributors will take their place within the Jermyn-street building, for I observed upon leaving on Monday evening the lecture room in which Prof. Huxley had been so ably instructing the 500 or 600 working men who had assembled to hear him men were distributing outside the door of the theatre (not be it remembered outside the building) disgusting handbills inviting the recipients to a meeting at Freemason's Hall to agitate for the desecration of the Sabbath by compelling the attendants at museums to work on Sunday as well as during the six days appropriated to labour.

It is to be regretted that the names of such men as Huxley and Tyndall should be found side by side with professed atheists for accomplishing such an evil object, especially as it is beyond question that were success achieved no class would suffer so severely as the working men, who it is pretended desire the change. It would be introducing the thin edge of the wedge for obtaining seven days' labour per week out of the working man, which, indeed, would be a very proper sequel, for it would be absurd to permit museum attendants to work on Sunday and at the same time object to carpenters, masons, blacksmiths, and others doing the same. Working men should not forget that in Paris, Brussels, Geneva, and all other cities and towns on the Continent, where the museums and other places of amusement are opened on the Sabbath, you find work going on in the engineers' shops and on the buildings in course of erection precisely as on any other day of the week, so that the working man has no more time for recreation than is secured to him by the Saturday halfholiday system in England. Let the workman have all possible facilities for visiting museums, theatres, and every other place of amusement during the six working days (and from the low price and ease of moving from one part of the Metropolis to the other by the almost innumerable tramways, railways, and omnibuses but little improvement on the present need be desired), but for the welfare and freedom of the general body of working men, even more than of the museum attendants, let not the shortest step be taken towards introducing the Continental Sunday.

May 14. A VISITOR.

COAL WASHING.

SIR,—In the condensed report of my lecture on the above subject, which you lately published, an error occurs in stating the cost of washing. Instead of 1s. 4d. it should be 1·4 pence per ton. I may say that at a works in Germany, where a very fine plant has lately been erected capable of washing 1200 tons of coal in ten hours, the labour cost per ton of coal washed is under one farthing per ton, the general and maintenance expenses being correspondingly low. This is effected by such a systematic arrangement of machinery as cannot be seen anywhere in Great Britain, the whole being practically automatic in its action. The automatic refuse discharges (and which really deserve the appellation of automatic) have been still further improved since the date of my lecture by getting rid of the drawback of the escape of water, and washing machines fitted with these discharges require no attention from month's end to month's end, and draw off the rubbish with a regularity hitherto unknown. The introduction of the spitzkasten, or pointed settling-box, is a feature in coal washing establishments in Germany. It acts as a perfect classifyer for fine grained coal, which is with difficulty screened when damp, and to a great extent as well gets over the difficulty experienced with settling tanks, which are seldom properly attended to. Fine grained coal from 8 millimeters down to 1 millimeter is now successfully and economically purified by special machines, which are simple, and not liable to get out of order. This is important to us, not only as a question of economy but also as a means for avoiding the penalties which the River Pollution Act imposes upon those contaminating streams.

Bristol, May 14. M. GEOFFREY MORGANS.

REMINISCENCES—No. IV.

SIR,—The miners of Cornwall have long been remarkable, in contrast with classes in other parts of England, for their orderly and loyal conduct, especially since Mr. Wesley's first visit to the county. The moral and religious reformation effected by the ministry of Wesley and his coadjutors is apparent everywhere. Although sinners of every kind abound, and greatly exceed the number of the good people amongst us, there are nowhere the rampant vices for which the Cornish were distinguished in the last century. The villainy of wrecking—I mean the robbery committed on stranded or wrecked vessels—does not exist now as formerly, when the miners and others habitually stole everything they could lay their hands on from vessels unfortunately getting on shore. They would scarcely wait for the ships to be broken up by the sea; they were ready with their axes to cut them in pieces, and with carts at hand to carry off the plunder of cargoes and broken wood. All such property they called their own. They even lighted fires on cliffs that masters of vessels, mistaking them for established signals, might go ashore, and fall into the hands of the wreckers. Property so acquired they called "lawful prey!" Nothing of the kind now exists in the county; the spirit of covetousness in that respect is (partly, at least) extinct; compassion for the unfortunate seamen has taken the place of the covetous desire of securing for themselves the property of other owners. I grant that the same opportunity does not exist now, because of the vigilance of the coastguard men stationed round this island. The practice of smuggling is also extinct. I know it could not be carried on long with impunity, for the same reason that wrecking is checked, but I believe the disposition for smuggling, as well as wrecking, is generally nearly *non est*. Drunkenness is also, probably, less prevalent than in past times, although now, alas, it is a wide-spread evil, despite all the labours of temperance societies.

The following specimen of hardness of heart is far from the general character of Cornish miners. It occurred either at Madron or Gulval about two or three years ago. A drunken man lost his wife by death. On the way to the burial he walked before the corpse of his wife (being then in a drunken state) when he said—"Come along, old jade, we have lived together long enough."

In the year 1812 a man called James Stephens—by nickname Duffan—committed suicide by jumping from a boat into the Truro river at King Harry passage. He was buried at Castle Hill, Truro, as a felo-de-se, a stake being driven through his body. Some drunken men disputed the fact of the body being deposited there, alleging that the Devil had carried it away. To determine the dispute it was agreed that they should go and dig in the spot where he was buried. They dug, and came to the body, which settled the dispute. This man was once a Methodist preacher of great note. King George the Third expressing a desire to hear a Wesleyan preacher, Stephens preached before him, beginning with "Hear, O king." He afterwards fell from grace through drink, and never recovered his piety. As an illustration of his power, it is said that, being pressed by an angry creditor, he met him at the office of the late Mr. Wallis, of Helston, where he pleaded his own cause so pathetically that the eyes of the creditor, the clerk, and then of the stern old lawyer became suffused with tears, and at last the first burst out, saying—"Well, never mind, give him up the debt, and let him go," which accordingly was done. It appears that his married life was not a happy one (how could it be?) if we may judge from the epitaph, written by himself, and engraved on her tombstone, where it remained till removed by the minister of the parish. "Found drowned" would have been the proper verdict on his body, because there was no evidence of suicide. It was assumed to be so from the fact that an apprehending warrant was issued against him for a serious crime, and that to avoid the consequences he went into the water.

How very difficult it is to understand Nature's laws. At Wheal Vor the richest part of the tin lode was in the clay-slate formation. On entering the granite in Carleen it became poor. It was a monster lode, varying from 4 to 30 ft. in width, and the best lode in Cornwall. Probably Dolcoath is next. The tin ore dipped easterly, and failed in value. Wheal Alfred, in clay-slate, two or three miles distant from granite, was rich in the first working. Alfred Consols, eastward from Alfred, was also very rich. Tresavean Mine was very rich in the granite, but the lode on entering the clay-slate was split into small veins, not worth pursuit. The Consolidated Mines were very rich in the clay-slate, and the lodes were also rich in the granite in Wheal Damsel, &c. Wheal Jewell, on lodes about 50 fathoms north from Consols main lode, was very rich in clay-slate, but poor in the granite (in Tolcarne). Wheal Unity, Gwennap, still further north, was in like circumstances. I must leave the exposition of Nature's laws to Mr. R. Hunt, F.R.S.

Speculation is almost dead so far as mining is concerned, for there is no such thing as inducing capitalists, except a few, to invest even in really good properties. I would caution them against patronising the reopening of deep mines, which may be regarded as being exhausted.

If war with Russia is averted it is likely that some capital may flow into mines this spring. Mines wisely selected will pay even now. Shallow and inexpensive mines should be taken up. There is one such mine that I know, which is sure to pay well—I refer to East Ellen, in St. Agnes. It is rich at adit level; nothing done

below it. A small capital would make it pay well in three or four months.

In speaking of honest brokers in a paper recently sent to you, I omitted the name of one of whom I have neither heard nor read for a long time, but who in point of honour should be mentioned—I mean Mr. H. B. Rye, of Old Broad-street. I hope he is still alive.

On opening an old memorandum book or journal of mine, I find under date of April 24 the following entry:—"Died on the night of the 23rd inst., at or near Taunton, from wounds received in his legs by the upsetting of the mail coach, Mr. Joseph Roberts, solicitor Helston, about 50 years of age, leaving eight children." Mr. Roberts was the father of Mr. Roberts, late partner with Mr. P. P. Smith, Truro, who died a few months ago. Mr. Roberts of Helston was the solicitor for the bankruptcy of Messrs. John, Thomas, and William Gundry, of Goldsithney (the chief owners of Wheal Vor), which was declared in 1819. He was on his way to London on this business when the coach upset. The business was not closed for many years after 1830.—*May* 11. OBSERVER.

ASSHETON AND WEST ASSHETON LEAD MINES.

SIR,—"A Shareholder," who wrote you some weeks since, has done good service in placing before his fellow-shareholders the actual position and value of our mines. I can fully confirm all your correspondent's statements as to the mines. Capt. Rickard has not in any way exaggerated their value in his late reports.

As to Assheton, it is a very extensive mine, having east and west and north and south lodes, all very productive, opened and worked upon by a considerable number of men; but I would direct shareholders' attention chiefly to West Assheton. There are altogether seven pitches, of which five are in the 60 fathom level and the remaining two in the 50 fm. level, each being sections of splendid ground. But those in the 60 are the best, especially Nos. 2 and 3; at the lowest estimate these two pitches will produce 30 tons of ore per fathom. This gives a very faint idea of the value of the lode in this level. All the others, save one, are proportionately rich. A small drivage has been made in the 60 west, where a slight improvement has taken place, but it should be remembered that only 13 ft. have been driven under the new management, so that it is hardly possible that any great change for the better can be expected in such a short distance.

Looking at all these facts, one is at a loss to know why the shares are quoted so low in price. I am not sure that with a very small outlay the 70 and 80 fm. levels could not be driven west and communicated with the 60, thereby opening out such valuable sections of ground as would place West Assheton, in a very short time, the first dividend mine in the list. This is no imaginative picture—on the contrary, this statement is based upon real and solid facts.

Several shoots of ore for several fathoms in length may be seen in the bottom of this level for nearly its whole length of 150 fms. What greater proof does the company want—nay, what more substantial evidence can it possibly have in order to work the mine in a proper manner?

Now the shaft is down why are not the 70 and 80 fathom levels driven? There is plenty of ore being raised from the little ground which is being opened. A more vigorous development would quickly cause West Assheton to vie with its adjoining neighbour, Tan-y-Bwlch.—*May* 14. MINER.

MINING IN NORTH WALES—PANT-Y-MWYN.

SIR,—Permit me the privilege of submitting through your valuable Journal a few words in favour of the above undertaking, such as may commend to the public a rapidly rising and apparently safe investment concern. Some short time ago I visited the mine alluded to in company with a few friends, who, like myself, chanced casually to be in the vicinity, for the purpose of verifying by personal examination the highly expressed terms in which the future prospects of the Pant-y-Mwyn had been mentioned to me on a previous occasion by one of the largest shareholders therein. Not being technically conversant with descriptive mining terms, I refrain from infringing upon your space by attempting a recapitulation of the masterly manner in which the company's agent (Mr. Thomas Hughes) tersely explained the origin and gradual development of the work under many retarding disadvantages. The point which chiefly engrossed my attention was his statement that even since the last annual general meeting of the shareholders in August, 1877, or thereabouts, the quantities of ore obtained has been sensibly increasing to such an extent as to admit of an interim dividend being paid early in the present year, and he assured me that impartially presenting me with his opinion, as a practical individual he felt justified in asserting that each succeeding month would tend to confirm by increased results in a still greater degree the financial soundness of the mine in question.—*May* 14. VERITAS.

P.S.—I deem it a simple act of justice to add that I have seldom (if ever) experienced an equal degree of courtesy to that shown myself and friends by the various parties connected with the Pant-y-Mwyn Mine with whom we came in contact. V.

THE FIVE-WEEKS MONTH.

SIR,—As I have seen that with equal impartiality you have admitted lettors on both sides of this question, the mention of my name in your report of the Tavistock meeting encourages me to hope that a few words in defence of the position I took up will find place in the next issue of your powerful paper.—1. I do not see that it requires a six months', or a six weeks', no, not even a six days residence in the mining districts to compare the merits of the four and five-weeks month. Even provided that the men would obtain five weeks' wage for five weeks' work, that system, we who are acquainted with many a secret of the miner's economy, know to be a fruitful parent of extravagance, thriftlessless, and despair; extravagance in that the sudden acquisition of a large sum is a temptation to reckless expenditure; thriftlessness, in that in the interval between wages debt is the necessity of the miner's life; despair, in the case of those, nor are they few, who would fain hold up their heads in the world and are crushed in their attempts so to do.

2. It is the moral aspect of the matter, Sir, which interests us "clergymen and others." We are most of us averse to strikes We believe that, viewed in the stern light of political economy, most strikes are unjustifiable, and that wages are, as I ventured to urge in my speech, inevitably and necessarily determined by the laws of supply and demand. This is, however, no strike; it is simply a refusal of the men to accept a fresh contract. A reduction of wages, however low wages may be, would meet with little comment on the part of the public, who would rightly leave employer and employed alone. But this case is one which touches, in the opinion of many, on the very heart of morality itself.

If we, the clergy, see a demand made on the men which we believe would encourage the very vices we preach against, what would become of our character for honesty if we preserved an unbroken silence? No words spoken in the pulpit in favour of justice and fair dealing would go for much; we would be thought to be believers in the doctrine that "might is right." Nor can we forget that the five-weeks month was condemned by the united voice of the two counties exactly six years ago, and also that at the present moment we hear not a single voice in the neighbourhood raised in its behalf. The men have suffered the evils of the five-weeks month before, and are resolved, if it may be, not to suffer them again. They ask if they are to receive their full pay for a five-weeks month, and why reintroduce the system. Can the gain, they enquire, to the shareholders equal the misery they would suffer? I hope that whatever "A Large Shareholder" may think of motives of philanthropy his opinions are not any more supported by the smaller shareholders than they are by the "clergymen and others," "others" comprising almost all the influential people in the district who attended the Tavistock meeting. It is because we are personally acquainted with the miners' homes, and can from our intercourse with them sympathise with their troubles, that in a case like the present we, whether we are mistaken or not, find ourselves impelled to speak and act on the side of those we believe to have right on their side.—*Tavistock, May* 15. E. O. SCHUSTER.

P.S.—If I am not mistaken it was not till last week that the men were assured they would get their full pay for a five-weeks month. Our meeting took place before the men received this assurance, yet we hear still of a division that would be made among the workers that some would still only earn 48 weeks' wage a-year even if others did get 52. Our objection, however to the five-weeks month in any form would still hold good. E. O. S.

DEVON GREAT CONSOLS.

SIR,—My attention has just been called to Mr. Alford's letter in the *Mining Journal* of May 4, with reference to the proposed return to the five-weeks month at Devon Great Consols, and I cannot refrain from recording my conviction that with some little amendment it is a step in the right direction. I dare say Mr. Alford is working on behalf of the men with the best of intentions, but when he talks of "protest" it looks to me as though it was more a matter of interference as between employer and employed, and in matters that do not concern him. I do not know if Mr. Alford is personally interested in the mine or not. His duties may frequently bring him in contact with the miners, but it is very questionable whether he knows anything of the working of the mine beyond what he is told, or what is or what not most beneficial to the interests of the shareholders. To revert to the main question at issue—the effect of the change from 13 to 12 months' pay in the year—I do not believe the men would be one whit worse off than they are or have been for the last seven years, and although from all I can learn the feeling exists, especially in the county, that the object is to bring down the wages of the men to below what are now but little better than starvation prices, I have that confidence in the directors, with whom I am pretty well acquainted, to believe it is far from their wish to take any advantage of the men, or to interfere in any way with their present earnings. Mr. Alford thinks the movement is not so much against the agents as the men; here I believe he is under a mistake, for I do not doubt for one moment that the alteration to the five-weeks month is for the purpose of doing away with the 13th month's pay to agents and most, if not all, monthly men, and my impression is that the action of the directors is perfectly justifiable, seeing the trust imposed upon them by the general body of shareholders. It appears that there is at the present time a staff of 10 or 12 agents, including four clerks, and that their monthly pay is very close upon 100*l.* a month, which they receive 13 times per annum. (This is irrespective of monthly men.) Probably half the agents would be ample for the proper working of the mine, and I venture to say from some little experience in the duties of a mine clerk, that the whole of the office work at Devon Consols might be carried out by at least two efficient book-keepers, and equally as satisfactorily as under present arrangements. When Devon Great Consols was in its prime, and bi-monthly dividends were being paid to the lucky shareholders, these would, perhaps, have been petty matters to comment upon, but circumstances alter cases. Some of the present members were original holders, and have not only received many hundreds per cent. upon their first cost in dividends, but have from time to time reduced their interest, and when shares were quoted at 200*l.*, 300*l.*, and 400*l.*, and consequently now stand with a handsome balance to their credit? Of course these "successful miners" can afford to be liberal, and to wink at what may appear to them now to be trifles, but how about those shareholders who have purchased large interests at high prices, and have received little or nothing by way of return? And there are, doubtless, many. This appears to me to be an argument in favour of economy, and it may be the directors, having the present proprietary in mind, are determined to economise to their utmost, and to do away with all superfluous and unnecessary expenditure—at the same time having regard to the welfare of their men. There is no necessity, as Mr. Alford suggests, for the directors to go down and enquire amongst the men as to the working of the system. Whether five weeks' or four weeks' pay, the men, if they choose, will be allowed to earn their 15s. or 18s. per week as heretofore. What is wanted, in my belief, is more frequent pays; no man ought to be compelled to go four or five weeks without his money for many reasons, and my idea is that were it to be proposed to the men who may probably throw up their employ next Saturday to pay them fortnightly, or 24 times in the year, they would at once accept the compromise, and the directors would act wisely in at once coming such a resolution, and obtain much credit for the concession. Agents and monthly men would of course come under the same regulation, with the understanding that they were to receive but an equivalent to 12 months' pay. Were one or two of the shareholders to make a quiet visit to the neighbourhood of the mine they might possibly hear and see that there was ample room for further retrenchment, quite irrespective of reductions in salaries, which some may think have been given out with a liberal hand when it is taken into consideration that comfortable residences are on the mine, and that neither quarter-days nor tax collectors disturb the rest of the fortunate tenants. Devon Consols has for ever been what may be termed a family mine, and how many snug berths have been found for brothers, sons, nephews, &c., the writer sayeth not. Although, perhaps, too late to be of service, I hope the men may not be so ill advised on Saturday as to turn out against their employers, but, to give the directors the opportunity to prove that they are sincere with regard to their well-doing, let them mutually agree to go on under the twelve-months system (say) for three months; in the meantime I do not doubt but that some definite arrangement may be made for the good of "One and All." On the other hand, if the men feel they are not being fairly dealt with, I am not without hope that on proper representations being made, with evidence, their cause will have a full, fair, and impartial consideration by the directors.

In last Saturday's Journal I see that a subscription is proposed to be raised on behalf of the locked-out men. I am informed that many of the men—thanks to Mr. Alford, perhaps—are already in employ in the erection or repair of a church at Lamerton and another, if I remember rightly, in the neighbourhood of Beerferris.

Referring to another communication, why does not "X. Y. Z." say how it is that there are thousands of pounds worth of arsenic stocked in Devon Consols stores? Is it not in consequence of a perhaps injudicious contract made with a certain company, "limited" in more respects than one, and owing to the non-production of its equivalent—cash? These are bad times surely, but is it good policy to have in stock between 1000 and 2000 tons of arsenic when, perhaps, an unwise contract might be annulled, and, if not a better, a more certain market be obtained for clearing off the large accumulation?
May 14. ONE INTERESTED.

DEVON GREAT CONSOLS.

SIR,—It appears to me that the question to be determined at Devon Great Consols is, Who are to be masters—the directors or the labourers? Two things are certain—the employment and service are both voluntary. The men are not compelled to remain at the mine; they can leave if they please, and give place to others who will work on the directors' terms; but, as a friend to the miners, I advise them not to leave unless they can be sure of doing better for themselves and families elsewhere, for I never knew of a strike which was not followed by distress to the men themselves as well as injury to their employers in the manufacturing and coal districts. Happily in our mining districts strikes have been rare, and such is the present state of mining in Cornwall that the labour market is over stocked. If 1000 men were required in a mine they could be got together in a few days on the terms offered by the directors. It is absurd, therefore, for the men to think to coerce the directors. Far be it from me to advocate any proceedings that would be oppressive on any class of the community, and nothing in this case of an oppressive nature is intended. If the directors wish to return to the old calendar month mode of payment they have a right to do so, and by doing so they inflict no injury on the men. The calendar month is the most natural mode of payment in mines, the other mode being a recent innovation. Supposing that the directors find that the returns from the mine do not meet the current costs, and that to keep the works on a slight reduction in the wages is imperative, would it not be better to submit to such reduction than to leave the mine, without knowing where to go? I do not know, however, that any reduction is contemplated by the directors.

The Devon Great Consols Company can do without the men better than the men can do without them. They are not dependent on the mine, and may suspend operations any day, but I apprehend that a suspension of the operations there would be followed by distress—temporary at least—to the labourers of every class who now obtain their bread by working there. The "five-weeks month" question is not a sufficient reason for men to run away from the mine, and I advise them to think and look before they run. Let them look at the consequences in the North of England to the men who acted on the advice of an evil agitator, and left their work thereby, bringing ruin on themselves and their families, and on others too. I should be glad if the prices of the products of our mines would enable the directors of companies to give men higher wages than they now receive, especially as animal food is so dear, but with tin at a little over 30*l.* per ton, and copper very low, they cannot afford it without taking the money out of their pockets, and so go the road to ruin.—*Truro, May* 14. R. SYMONS.

DEVON CONSOLS.—TWELVE-MONTHLY PAYS.

SIR,—During the last few years, and more especially now, we are, as a result, paying indeed dearly for "Strikes," not only by employers, but the employed; and it has brought home to the very doors of the agitators of these "Strikes" nothing but loss, misery, and utter ruin to the trade and prosperity of this country.

In good and prosperous times men, especially miners, were found to be continually pressing, if not clamorous, for advances of wages, short hours, holidays, and so forth; but when adversity comes on the owners of mines, and a reduction of wages, increased hours of work, or other necessary arrangements, are required "to make both ends meet" these fearful bad times, we generally find a strike is resorted to without any rhyme or reason. I have read the various letters in the Journal, and communications on the so-called strike (I hope not), as it is termed, at Devon Consols. I must say I never, in all my long experience of human nature, remember such a ridiculous and foolish attempt of those employed at these mines to become dictators and masters of our once prosperous undertaking—men who have been in the employ, I presume, of the company for so many years, and have in days of prosperity been well—yes, indeed, in very many cases, no doubt, doubly—paid for what they have done, I cannot bring myself to believe that Devon men will desert the company when in comparative adversity simply because the directors ask them, and with all reason these fearful hard times, in order to here make both ends meet, by paying them for their 52 weeks' work by 52 weeks' pay in 12 monthly payments, instead of 13 times.

I remember when I bought shares at 465*l.*, and close on 500*l.* each, there were but 12 monthly payments; and why not again now, if the directors and shareholders so desire it? Being "Derby" week, I may not be able to attend the meeting of shareholders; but I certainly shall send my proxy to the directors, and most heartily support their endeavours, if it become necessary, in this question of 12 monthly pay-days. If I can, however, attend, I shall most assuredly speak my mind on this and many other reforms required at the mines, from what I have recently heard from near the mines. Our costs for year after year have been, I consider, a great deal too high; not but that operations underground ought to be carried on with the greatest vigour to make discoveries, and renewed energy, I think, is required in every department to attain this object. The directors, I feel convinced, have but one object in view—to do the very best they can for the shareholders, and all those they employ, during these anxious and painfully depressed times, which have never occurred, perhaps, during the life of the oldest miner in Devon. Personal animosities should never exist between employers and the employed in any business disputes or difference; and from all I can learn from around the mines, but for the interference of those who have neither directly or indirectly the real welfare of those employed at the mines at heart, the alteration as requested would have been accepted. All employed by the company may best serve themselves and their families, now and hereafter, by showing a conciliatory spirit to meet the directors' desire in these depressed times, for they may rest assured (and I feel perfectly confident of this) that should copper again advance, and discoveries of ores be made, the wages of those who now resume work will most assuredly not be forgotten.
May 16. ANOTHER LARGE SHAREHOLDER.

DEVON GREAT CONSOLS.

SIR,—Replying to "A Large Shareholder's" letter, in last week's Journal, I would venture to hope, as a resident in a thickly populated mining district, that on a question materially affecting the earnings of the miner throughout the counties of Cornwall and Devon I may be permitted, without the imputation of "impertinence," to continue, through the medium of the Journal, to make such remarks as may become necessary in the interest of the men and their distressed wives and children who are suffering from the present unfortunate calamity which has so suddenly fallen on the neighbourhood of the above mines.

"A Large Shareholder" naively scoffs at "anonymous" writing, whilst the very letter in which he expresses his indignation is itself written anonymously, a mark of innocence on the part of the writer which will, probably, be remembered with some little amusement after the controversy is over. On the question which has caused so many heart burnings, and which is now causing so much poverty and distress, I submit the following facts for the serious consideration of "A Large Shareholder" and all shareholders in Devon Great Consols, on whom a serious responsibility must ultimately fall:

In the first place, I would call attention to the fact that a mode of payment which had become so odious as to be no longer tolerated was abolished, at an influential county meeting held at Truro, in Cornwall, in the year 1872. Since that date the rule throughout the two western counties has been to pay the men their earnings every four weeks, and this system has given full satisfaction. During the present depression in mining the men of Devon Great Consols—which mines have paid something like 1,250,000*l.* sterling profit, at an outlay of only about 10,000*l.*—have had their wages reduced from time to time, until they actually become lower than the other mines in the district, where the shareholders have been paying calls for years past. After reducing the wages to a degree reaching a point of poverty, a mandate is suddenly issued from the London board, resolved upon, it is said, at an ordinary weekly board meeting, with only two of the most recently appointed directors present, peremptorily enforcing on the sorrow-stricken men and their families the old abhorred and abolished system of the five-weeks month. They had borne a reduction of their wages equal to nearly three months' pay in the year without a murmur, but this terrible infliction was more than they could suffer, and at length the trodden down men made an effort to seek for an honourable recognition of their services by a respectful appeal to the consciences of their employers, but their supplications were of no avail. Not even a word of explanation was accorded to the men; they must submit, and submit at once, or starve as far as the humanity of the board was concerned; and at this moment the families of the men out of employment are existing in a state of privation and misery.

Will "A Large Shareholder" be good enough to give some tangible reason for the harsh and unexpected measures taken in a time of depression to force the poor men into a system which they utterly detest; and at the same time he will, perhaps, explain why the Devon Great Consols should be an exception to the salutary rule of payment adopted for years past throughout the counties of Cornwall and Devon—if he can? The whole proceeding stands condemned throughout the length and breadth of the land. X. Y. Z.

DEVON GREAT CONSOLS.

SIR,—On Saturday next the whole of the men in the mines underground and at surface (including the arsenic works, foundry, smiths, and carpenters) will go out, and the most firm resolve is being manifested by all never to work under the five-weeks system again. Meetings are being held among the miners in the Caradon district, which are to be extended through the West, and at Tavistock, Gunnislake, and the surrounding neighbourhood subscriptions are already assuming a substantial form. It is reported that although the men in the eastern part of the mines have been out nearly a month, not a man from Cornwall has crossed the Tamar to attempt to take a single bargain out of their hands. This speaks volumes, and the men are assured of sympathy and help from every mine in the two western counties. At the meeting to be held during the present month the fullest enquiry will be made into the whole matter, and the consciences of the whole of the shareholders will be earnestly appealed to on behalf of the men. A CORNISHMAN.
May 16.

WHEAL PEEVOR CHAMPAGNE DINNER.

SIR,—Ever since the last meeting of the Wheal Peevor adventurers I have been on the look out for a notice of the day on which Captain Abraham James is to give a champagne dinner in fulfilment of his promise. I understand that he promised to give such a treat if Wheal Peevor could be made to pay a dividend with tin under 40*l.* per ton. It has paid a dividend with tin under 36*l.* per ton, so the dinner is due, and will, of course, be forthcoming, for it cannot be conceived that Captain James will be "worse than his word." But as champagne can but rarely be found genuine I beg to suggest that good coffee be given instead of wine. I never took a glass of good champagne since I took it for the first time in my life at Evans's Hotel, in Covent Garden, London, in February, 1857. Of course, I cannot dictate in the matter—I can only express my private feeling that I prefer good coffee to bad wine, and when I go to the dinner I purpose to put some in my pocket; I dare say that sugar and milk will be at hand in the account-house. J. T.
Redruth, May 11.

[For remainder of Original Correspondence, see to-day's Journal.]

FRANK MILLS (Devon).—The committee have decided that fair samples of the whole of the burrows, halvans, slimes, &c., throughout the mine should be taken and tested by a competent assayer, and Mr. M. W. Bawden, of Liskeard, has been deputed to take the necessary samples and make a thorough analysis of the various accumulations, estimated at over 150,000 tons at surface, so as to ascertain the correct percentage of lead and silver contained in this large deposit from the commencement of the mine's returns previous to its being submitted to the crusher and other treatment, the result of which is being looked forward to by the shareholders with some degree of interest.

GOVERNMENT INSPECTION OF MINES.

THE INSPECTORS' REPORT.

The improvement in connection with the Government Inspection of Mines noticed last year has not been maintained; in fact, the number of deaths from colliery operations have increased 30 per cent., having been 1208 in 1877 against 933 in the preceding year. It appears that only 123,217 tons of coal were wrought for each life lost, against 159,688 tons per life lost in 1876. During the year reported upon there were employed in and about the mines under the Coal Mines Regulation Act 494,386 persons, who raised 134,179,968 tons of coal, 1,813,541 tons of fire-clay, 12,014,356 tons of ironstone, and 838,395 tons of oil shale, &c.—together, 148,846,260 tons. There was one life lost in 1877 for each 409 persons employed. During the preceding year 134,125,166 tons of coal, 2,071,983 tons of fire-clay, 12,159,580 tons of ironstone, and 632,656 tons of shale, &c., were produced in the mines classed under the Coal Mines Regulation Act. Comparing the above quantities, it will be seen that the output of coal has increased scarcely more than 50,000 tons. During 1876 there was one life lost for each 551 persons employed. The number of collieries in operation during 1877 was 4231, against 4385 in the preceding year. We subjoin our usual tabulated summary, which will permit of the several classes of accidents being compared:—

COAL MINES—1876.

Names of districts.	Separate accidents.					Deaths resulting.				
	Explosions of fire-damp.	Falls of coal, sides and roof.	In shaft.	Miscel., in mine and at surface.	Total.	Explosions of fire-damp.	Falls of coal, sides and roof.	In shafts.	Miscel., in mine and at surface.	Total.
Northumberland, Cumberland, North Durham	2	34	5	26	67	3	35	5	27	70
South Durham & Westmoreland.	2	42	5	26	75	5	42	5	26	78
Cleveland, ironstone	1	7	—	8	16	1	7	—	8	16
North and East Lancashire	3	22	5	14	44	5	24	7	15	51
Ireland	—	—	—	—	—	—	—	—	—	—
West Lancashire and North Wales	11	60	16	28	115	14	61	18	28	121
Yorkshire	3	35	9	22	69	3	35	9	22	69
Ditto, coal field ironstone	—	1	—	—	1	—	1	—	—	1
Ditto, Lincolnshire ironstone	—	1	—	—	1	—	1	—	—	1
Derby, Notts, Leicester, Warwick	1	41	7	17	66	6	46	8	17	77
Ditto, ironstone	—	—	—	—	—	—	—	—	—	—
North Staff., Cheshire, Salop	3	17	8	14	42	11	17	8	16	52
Ditto, ironstone	—	2	—	2	4	—	2	—	2	4
South Staff. and Worcestershire	4	31	15	22	72	5	33	18	22	78
Ditto, ironstone	—	1	1	—	2	—	1	1	—	2
Monmouth, Gloucester, Somerset, and Devon	4	28	6	9	47	29	29	6	9	73
Ditto, ironstone	—	1	—	—	1	—	1	—	—	1
South Wales	3	51	19	38	111	4	54	20	39	117
Ditto, ironstone	—	—	—	—	—	—	—	—	—	—
East Scotland	1	33	12	14	60	2	35	12	21	70
Ditto, ironstone and shale	—	3	4	1	8	—	3	4	1	8
West Scotland	4	18	5	4	31	7	20	5	4	36
Ditto, ironstone and shale	—	2	3	2	7	—	2	3	3	8
Total coal and fire-clay mines	41	413	112	134	800	94	432	121	246	893
Total ironstone and shale mines	1	17	8	13	39	1	17	8	14	40
Gross total	42	430	120	247	839	95	449	129	260	933

COAL MINES—1877.

Northumberland, Cumberland, North Durham	1	31	3	29	64	1	32	3	30	64
South Durham & Westmoreland.	1	37	12	45	95	1	37	12	45	95
Cleveland, ironstone	1	10	—	10	21	1	10	—	10	21
North and East Lancashire	9	20	7	20	56	42	21	9	20	92
Ireland	—	1	—	—	1	—	1	—	—	1
West Lancashire and North Wales	3	44	14	23	84	40	47	17	23	127
Yorkshire	2	55	15	26	98	3	56	19	26	104
Ditto, coal field ironstone	—	2	—	—	2	—	3	—	—	3
Ditto, Lincolnshire ironstone	—	—	—	—	—	—	—	—	—	—
Derby, Notts, Leicester, Warwick	1	29	6	15	51	1	30	6	21	58
Ditto, ironstone and fire clay	—	—	—	—	—	—	—	—	—	—
North Staff., Cheshire, Salop	3	16	9	13	41	3	16	9	13	41
Ditto, ironstone	—	3	—	1	4	—	3	—	1	4
South Staff. and Worcestershire	6	44	8	12	70	11	47	10	12	80
Ditto, ironstone and fire clay	—	—	—	—	—	—	—	—	—	—
Monmouth, Gloucester, Somerset, and Devon	2	28	4	17	51	2	29	4	18	53
Ditto, ironstone	—	2	—	—	2	—	2	—	—	2
South Wales	6	53	16	26	101	23	53	16	30	122
Ditto, ironstone	—	—	—	—	—	—	—	—	—	—
East Scotland	6	25	14	14	59	212	27	15	17	271
Ditto, ironstone and shale	—	7	1	3	11	—	8	1	3	12
West Scotland	2	25	4	9	40	2	26	4	10	42
Ditto, ironstone and shale	2	—	4	7	13	3	—	4	7	14
Total coal mines	42	408	112	249	811	341	422	124	265	1152
Total iron, fire-clay, and shale.	3	24	5	21	53	4	26	5	21	56
Gross total	45	432	117	270	864	345	448	129	286	1208

The number of persons employed during 1877 in and about the mines classed as metalliferous was 57,395, against 57,497 in the preceding year. Of these, 34,095 were employed underground, and 23,300 at surface. Of the latter, 185 (162 in Cornwall and Devon) were females under 13 years of age; 1204 (965 in Cornwall and Devon) were females between 13 and 18; and 1947 (1621 in Cornwall and Devon) were females above 18: total females, 3336, or about 6 per cent. No females were employed underground. From the subjoined summary it will be seen that in the aggregate the following quantities of mineral were produced during the two years reported upon:—

Mining Produce.	1876—tons.	1877—tons.
Arsenic (obtained at the mines)	4,091	4,110 17-20
Arsenical pyrites	12,949	5,341 5-20
Barytes	21,253 14-20	19,481 6-20
Bauxite	—	2,763
Bismuth and cobalt ores, mixed	2-5	8-20
Bluestone	50	—
Brick-earth	—	2,411
Building stone	199,002	331,101
Calc spar	1,690	2,353 1 10
Cement stone	940	2,304
Chert	3,790	3,290 9-10
Copper ore	71,741	65,217 6-20
Copper precipitate	770 17-20	628 2-20
Dross spar	66	142 7 20
Fire-clay and brick-earth	45	756 12 20
Flagstone	unknown	2,080
Fluor-spar	340	17 18-20
Ganister	589	439
Gold	24lb 5oz 13d 6gr	11lb 11oz 5d 18gr
Gold ore	13 qrs 7 lbs	1cwt 3qr 5lb
Gold sulphurets	—	2 tons 19c 0qr 8lb
Gypsum	68,276	73,908
Iron ore	2,637,546	2,815,848 14 20
Iron pyrites	18,552	17,794 18-20
Jet	unknown	unknown
Lead ore (dressed)	73,465 18-20	76,471 1-20
Lead ore (undressed)	3,655	3 938
Limestone	551,009	528,010
Manganese	2,797	3,038 14-20
Ochre and umber	3,600	2,867 7-20
Phosphate of lime	185	6
Pipe-clay and potter's clay	49,117	41,819
Plumbago	6	—
Purbeck stone for paving, kerbs, &c.	unknown	13,228
Rock salt (exclusive of the white salt made from brine)	186,841	207,942
Silver ore	—	142 10-20
Silver precipitate containing copper	1 1-40	—
Slate and slabs dressed	156,887	172,130 10 20
Slate undressed	—	80
Steatite	75	68
Tamping stone	120	100
Tin ore dressed (black tin)	12,003	12,665
Tin ore partially dressed (white), estimated to contain 34 tons of black tin	166	1,022 13-20
Tin ore undressed (tinstuff), estimated to contain 595 tons of black tin	13,485	11,511
Uranium ore	—	2 cwts.
Whinstone	14,922	18,308 1-20
Wolfram	10	15
Zinc ore	23,670 7-20	24,727 19-20

The fatal accidents at the mines, classed under the Metalliferous Mines Regulation Act, in Great Britain and Ireland amounted to 87, against 66 in the preceding year, the calamities thus being 30 per cent. more numerous than last year. From these accidents the number of deaths resulting was 97, being 27 more than in the preceding year. It appears that in 1876, in the mines classed under the Metalliferous Mines regulation Act, there was one fatal accident amongst every 871 persons employed in and about the mines, and one death by accident amongst every 821 persons employed; and in 1877 one fatal accident amongst every 659 persons, and one death by accident amongst every 592 persons employed in and about the mines. The subjoined summary will facilitate the comparisons:—

METALLIFEROUS MINES—1876.

Names of districts.	Separate accidents.					Deaths resulting.				
	Falls of ground.	In shafts.	Miscellaneous underground.	At surface.	Total.	Falls of ground.	In shafts.	Miscellaneous underground.	At surface.	Total.
Northumberland, Cumberland	7	7	3	—	17	7	9	3	—	19
Durh., Westm., & No. Yorks.	1	—	1	—	2	1	—	1	—	2
Cheshire, Lancashire, and Sussex	1	—	1	—	2	1	—	1	—	2
Derbyshire and Nottingham	1	1	—	—	2	1	1	—	—	2
North Wales, Isle of Man, &c.	5	1	8	2	16	5	1	8	2	16
South Staffordshire & Worcester.	—	—	1	—	1	—	—	1	—	1
Glouc., Monm., Somerset, &c.	1	—	2	—	3	1	—	2	—	3
Cornwall, Devon, &c.	6	4	5	4	19	7	5	5	4	21
East Scotland	1	—	1	—	2	1	—	1	—	2
West Scotland	—	—	1	—	1	—	—	1	—	1
Ireland	1	—	—	—	1	1	—	—	—	1
Total	24	13	23	6	66	25	16	23	6	70

METALLIFEROUS MINES—1877.

Northumberland, Cumberland	10	3	4	2	19	10	4	5	2	21
Durh., Westm., and No. Yorks.	1	—	2	1	4	1	—	2	1	4
East and West Yorkshire	1	2	1	—	4	1	2	1	—	4
Derbyshire and Nottingham	—	1	—	—	1	—	1	—	—	1
North Wales, Isle of Man, &c.	6	2	8	5	21	7	2	9	5	23
South Staffordshire & Worcester.	1	—	—	—	1	1	—	—	—	1
Glouc., Monm., Somerset, &c.	4	2	1	—	7	5	2	1	—	8
Glam., Pembroke, &c.	—	—	—	1	1	—	—	—	1	1
Cornwall, Devon, &c.	10	8	6	2	26	13	9	6	2	30
East Scotland	2	—	—	—	2	2	1	—	—	3
Ireland	1	—	—	—	1	1	—	—	—	1
Total	36	18	22	11	87	41	21	24	11	97

The subjoined tables show, amongst other things, that the increase in the output of coal has been unimportant, having amounted to only 54,802 tons, the figures being 134,179,968 tons in 1877, against 134,125,166 tons in the preceding year. There was a slight diminution in the number of collieries at work, the figures being 4231 for 1877, against 4385 in the preceding year. The subjoined tables also show the relative safety of the several districts; and it will be seen that in those most celebrated for good management and strict discipline the casualties have been fewest:—

1876.

Names of districts.	As computed by each Inspector for his own district.		Per separate fatal accident.	No. employed per life lost.	Tons of mineral raised per separate fatal accident.	Tons of mineral raised per life lost.	Number of mines.
	Males employed.	Tons mineral raised.					
Northumberland, Cumberland, & N. Durham	48,754	14,135,104	728	696	218,773	207,968	218
Do, ironstone*	—	11,552	—	—	—	—	—
So. Durham & Westm., & N. Riding of Yorks.	58,380	19,513,056	778	748	265,625	255,408	212
Yorkshire — Cleveland ironstone	9,851	7,867 / 6,564,101	616	616	410,748	410,748	46
North & East Lancashire	30,382	8,364,179	690	595	192,098	165,732	371
Ireland	1,365	125,195	—	—	—	—	39
West Lancashire and North Wales	42,174	11,509,339	366	348	100,762	95,765	312
Do., ironstone	—	22,204	—	—	—	—	—
Yorkshire	61,017	15,129,506	872	872	222,184	222,184	539
Do., ironstone	—	240,116	—	—	—	—	—
Lincolnshire ironstone	244	154,287	244	244	154,287	154,287	10
Derby, Leicester, Notts, and Warwickshire	52,348	12,331,546	793	679	189,394	162,338	419
Do., ironstone	—	121,379	—	—	—	—	—
North Staff., Cheshire, and Shropshire	27,779	5,559,106	603	496	164,600	135,207	250
Do., ironstone	—	1,868,730	—	—	—	—	—
Sth. Stafford & Worcester.	32,798	10,000,000	443	410	141,718	131,089	509
Do., ironstone	—	294,842	—	—	—	—	—
Monmouth, Somerset, part Glam., & Brecon.	33,244	7,121,209	692	449	153,918	99,838	415
Do., ironstone	—	142,745	—	—	—	—	—
South Wales	46,319	11,663,447	418	396	108,130	102,584	335
Do., ironstone	—	192,297	—	—	—	—	—
East Scotland	40,832	11,667,648	600	523	192,739	169,029	367
Do., ironstone	—	836,873	—	—	—	—	—
West Scotland	29,045	6,997,954	764	660	236,995	204,677	343
Do., ironstone	—	1,710,454	—	—	—	—	—
Totals and averages	514,532	146,284,746	613	551	177,580	159,688	4385

* The total quantity of ironstone from the different districts was 12,159,580 tons; which, added to 134,125,166 tons of coal, gives the total of 146,284,746 tons.

1877.

Northumberland, Cumberland, & N. Durham	48,019	13,316,156	750	727	213,361	206,837	212
Do., ironstone*	—	3,940	—	—	—	—	—
So. Durham, Wstmrlnd, & N. Riding of Yorks.	56,445	19,548,343	595	595	208,944	208,944	210
Yorkshire — Cleveland ironstone	8,569	8,075 / 6,289,745	408	408	299,896	299,896	46
North & East Lancashire	29,344	8,741,387	524	319	158,056	96,208	344
Do., ironstone	—	135	—	—	—	—	—
Ireland	1,248	140,181	1248	1248	142 221	142 221	38
W. Lancashire & N. Wales	40,342	11,426,745	480	318	137,165	90,723	301
Do., ironstone	—	2,811	—	—	—	—	—
Yorkshire	60,594	15,805,235	606	566	162,478	151,849	533
Do., ironstone	—	249,454	—	—	—	—	—
Do. Lincolnshire ironstone	183	122,991	—	—	—	—	10
Derby, Notts, Leicester, and Warwick	50,285	12,903,866	986	867	256,305	225,372	412
Do., ironstone	—	103,551	—	—	—	—	—
North Staff., Cheshire, and Shropshire	26,126	5,742,020	580	580	157,206	157,206	248
Ditto, ironstone	—	2,183,030	—	—	—	—	—
8th. Stafford & Worcester.	28,760	9,500,000	411	359	141,195	123,545	476
Do., ironstone	—	206,452	—	—	—	—	—
Monmouth, Somerset, part Glam., & Brecon.	31,906	7,056,136	602	580	136,792	131,818	394
Do., ironstone	—	95,442	—	—	—	—	—
South Wales	44,812	11,671,730	443	367	117,714	97,452	312
Ditto, ironstone	—	119,422	—	—	—	—	—
East Scotland	39,769	11,452,372	568	140	186,882	46,225	351
Do., ironstone	—	893,222	—	—	—	—	—
West Scotland	27,984	6,867,701	528	500	168,131	159,124	344
Do., ironstone	—	1,723,161	—	—	—	—	—
Totals and averages	494,386	146,194 344	572	409	172,276	123,217	4231

* The total quantity of ironstone from the different districts was 12,014,356 tons; which, added to 134,179,968 tons of coal, gives the total of 146,194,344 tons.

The above tables really embrace all the general statistics contained in the reports, and a large amount of information as to the precise circumstances under which the several accidents happened is given in the reports for each district. As usual, the reports supply many valuable suggestions and observations of a practical character, which will be fully referred to in subsequent Journals.

Manufacture of Steel.—The object of Messrs. Sheehan and Wells, of Great Portland-street, being more particularly the manufacture of steel from Cleveland and other inferior iron, the wrought iron is first steelified wholly or partially through by a process which consists briefly in embedding the iron in a compound (consisting preferably of common salt, carbonate of soda or sal soda, sulphate of soda, charcoal, and black oxide of manganese) in a box or chamber with a layer of raw limestone above and another below, separated from the compound by perforated plates, which box or chamber thus prepared or charged is then placed in a furnace for some hours, or until the iron is steelified to the depth desired. The iron thus steelified is then melted in an ordinary crucible (if necessary, with any suitable well-known flux); and to sufficiently decarbonize the steelified iron during the process of melting, or after the same has been melted and converted into cast or other steel, they add back oxide of manganese, metallic oxide of manganese, quicklime, and borax, either separately or conjointly. The cast or other steel so made is run into ingots in the usual manner, and afterwards tilted or rolled.

THE PARIS INTERNATIONAL EXHIBITION.

No. I.

[FROM OUR OWN CORRESPONDENT.]

The Paris Exhibition Buildings of 1878 have not been excelled for beauty and originality of design by any other buildings hitherto erected for Exhibition purposes. These remarks will be found to apply more especially to that portion of the building on the Trocadéro side of the Seine, which is intended to remain as a permanent structure. Its exterior, viewed from the Avenue du Trocadéro, Place du Trocadéro and Basse Franklin, is very striking and effective. It is erected on a very commanding position, the basement of the building being 100 ft. above the Quai de Billy, on the banks of the Seine. The advantage thus gained is, as may be apprehended, very considerable, inasmuch as the whole of the pleasure grounds and ornamental temporary structures, with a great portion of Paris, are overlooked, and simultaneously brought under view. The permanent building may be seen to most advantage from a position immediately in front of the entrance to the temporary Exhibition, which is situated on the opposite side of the Seine, on the Champ de Mars. From this site one is struck with the great architectural grandeur of the building, which, as a whole, is most enchanting, appearing as an immense palace, which in point of fact it really is.

The scheme for the Exhibition was suggested early in 1876, and the construction of the necessary buildings was authorised by a Decree on April 13, 1876. The financial scheme was considered to be an excellent one, and the undertaking was finally confirmed by the Chambers on July 29, 1876. The law thus imposed upon the State all risks, as well as the general direction of the Exhibition. Private interests were not, however, to be interfered with in any way by this arrangement. The City of Paris undertook to contribute 240,000*l.* towards the erection of the Exhibition buildings. Consequent upon some difficulties which presented themselves in connection with the owners of the site of the Trocadéro it was decided by the State that by the payment of a further sum of 120 000*l* the City of Paris should become the proprietors of the Trocadéro Palace. The important post of director was given to M. Krantz in August, 1876, and it was to his great skill and judgment that all the necessary though various departments for the execution of the works were so soon organised. The different offices having thus been created it was found that the available time for every detail in the execution of such a huge scheme was short indeed; but the experience gained by the French during their similar undertakings of 1863 and 1867 aided to a very considerable extent in bringing the present task to a successful issue. The time occupied by the construction of all the works connected with the Exhibition has been exceedingly brief; but fortunate circumstances, being the outcome of wisely considered arrangements, coupled with the mild winter of 1876, contributed in a very high degree to the rapid construction of the entire fabric. The modifications of the original scheme no doubt seriously augmented the first estimate without, as it appears, causing detriment to the actual progress of the works. The circular basin in the Place du Trocadéro is supplied with a fine cluster of water-jets, and its display is very imposing. A group of mains are connected to it which fills, and takes away the surplus water to supply part of the service of the Exhibition. The foundation of the Palace of the Trocadéro is very massive, being in some places as much as 60 ft. in depth; some portion, however, rests upon the rock itself. The quarrying of the rock underneath the Trocadéro rendering the site both difficult and costly to deal with; in fact, the actual cost of the Palace was considerably augmented in consequence of this. There are a series of arcades constructed in the foundation of the Palace, following around the central hall and along each wing, intended for laying the main pipes for feeding the cascades. Below the general level of these underground arches, and under the hall, will be found a large chamber, in which engines and boilers are fixed, and intended for the purpose of ventilating the building. The system of ventilation introduced was contrived by M. Bourdais in connection with M. Davioux, architect of the Palace. The former gentleman has considered the subject of sufficient importance to be introduced and discussed at a meeting of the Society of Civil Engineers in Paris, and he lays much stress upon the fact that the system of ventilation was thoroughly elaborated in the first stage of the design of the Palace. The central portion, or hall, of the Palace du Trocadéro consists of a circular theatre, capable of accommodating 7000 persons. From the Avenue du Trocadéro, Place du Trocadéro, Basse Franklin, the central hall, with its dome, is hidden from view by the façade and side halls and corridors. The principal entrance to the theatre is gained by a series of doors through a kind of promenade basement gallery or hall. The interior side halls contain staircases by which the upper portions of the theatre, or Palace, is reached.

The front elevation is relieved by two side halls, which project from the main front or façade line towards the Place du Trocadéro. Admission to the Exhibition and pleasure grounds is at present gained through these side halls. From the right and left of these halls wings radiate, forming the figure of a semi-ellipse, the greater portion of each wing being struck from two different centres, one of which has a radius of 300 metres. The radius of the theatre is 29 90 metres. The façade of the Palace fronting the Place du Trocadéro is very fine. From the basement, or nearly on a level with the main road, rise the elevation of the main entrance, consisting of nine large doors, fitted with glass, which are separated with partitions of ornamental stone work. The higher portion of this entrance consists of an upper storey, the front of which contains nine large circular-headed stone-framed windows. The upper portion of this front terminates by a series of ornamental brackets, carrying a beautiful line of heavy mouldings, which are surmounted by a bold but fine balustrade. The front line of this great entrance corridor projects outward from the general façade line by about several feet. It is covered by a roof, hidden from view by the strong course of mouldings and balustrade. From behind this balustrade, and in line of the principal façade, the front elevation rises to a considerable height, the upper portion of which is divided into a series of panneled divisions, which, in our opinion, would have added to the effect if they had been filled with ornamental glass work, which arrangement would have permitted a view of the dome, but the idea seems to have been to conceal this portion of the theatre, but for what reason is uncertain. On the right and left of the centre of the palace rise two square base towers, the apparent base of which commences above the level of the side halls, and are relieved by a bold line of brackets supporting moulding and balustrades joined to that of the façade screen, which fills up the lower space between the two towers, the general architectural effect being very grand. Each tower will be covered by a square shaped dome, and will contain a hydraulic lift some 203 feet in height. MM. Bonn and Lustrement, and MM. Edoux et Cie, of Paris, are making these lifts. The platforms to be worked in these towers are to carry 40 persons each at one time, and the power necessary for this will be communicated to each platform by a plunger 15¾ inches in diameter. Four columns will be fixed in each tower, one at each corner of the platform. A balance weight is contrived so as to pass through each of these columns for the purpose of balancing the platform and the plunger attached to the hydraulic machine. Doubtless some little time must elapse before these lifts can be brought into general use, but we have every reason to believe when the towers are once opened to the public a vast number of persons will avail themselves of the opportunity of viewing Paris from their summits. We trust, therefore, that the authorities will look well to the machinery, and use every means for the protection of life. Shafts for these lifts had to be sunk, and those acquainted with the geology of Paris know that the sinking would be somewhat difficult, as well as expensive, as different strata had to be encountered. It was found that the first depth of 65 feet passed through limestone stratum, and then a

stratum of sand containing water had to be dealt with, below which the chalk measures occur. The diameter of each shaft is about 2 feet 5¾ inches, and is lined with wrought-iron tubes in convenient lengths of about 8 feet each.

The Exhibition pleasure grounds descend from the Palace du Trocadéro, hence the lower side of the basement had to be raised a considerable height to form a level platform from whence the general structure was to be commenced. The lower colonnade is surmounted by a highly ornamented series of brackets, line of mouldings, and balustrades, behind which an open gallery surrounds the theatre. This portion is supported by the lower colonnade rising from the terrace and surrounding the palace, forming a splendid promenade, attached by flights of steps to another open promenade 12 ft. wide behind the colonnade in each side wing, the covered roof of which is supported by the pillars forming the colonnade. The wings attached to the side vestibules of the palace contain a gallery for their whole length of about 42 ft. in width. Each wing is divided into three equal parts, and relieved by as many towers, the end ones, however, being the largest and highest. These towers have square domed roofs, higher than the roof of the galleries, and with the side vestibules of the palace itself (which also have square domed roofs), relieve the monotony of the wings. The general effect of the whole structure is, as we have before said, not only imposing but magnificent; but we must confess that without the assistance of many plans we feel that it is quite impossible to do justice to the building by a mere description in words. To add to the grandeur of the scene there is in front of the palace a cascade which runs over ten waterfalls, the whole length of which is, measured from the front of the building to the ornamental receiving basin into which the water flows, about 210 ft. The receiving basin is about 143 ft. in length. The water is pumped up to a point on a level with the basement of the palace before running over the falls, and it is intended to furnish a supply for every purpose which may be required connected with the Exhibition and pleasure grounds. Arrangements have been made for an immediate supply of 4,412,000 gallons in each day of 13 hours, which quantity can, in case of need, be raised to 6,618,000 gallons in the same time. The pumping station established on the Quai de Billy side of the Seine will supply from the river the water required for the Reservoir Passy and the Place du Trocadéro. The grand cascade, as it may very properly be called, and referred to above, is ornamented by four gilt bronzed animal groups, symbolising Europe by a Bull, Asia by an Elephant, Africa by a Rhinoceros, and America by a Horse. The population of the six divisions of the world is also represented by six colossal statues.

Meetings of Public Companies.

PATELEY BRIDGE LEAD MINES AND SMELTING COMPANY.

A special meeting of shareholders was held at the offices of the company, Austinfriars, on Monday, to consider the present position of the company,—Mr. H. HUTCHINSON in the chair.

Mr. W. J. LAVINGTON (the secretary) read the notice convening the meeting.

The CHAIRMAN said that since the directors last had the pleasure of seeing the shareholders Mr. Batters had resigned the chairmanship of the company, and he (Mr. Hutchinson) had been appointed the chairman *pro tem*, but the distance which he resided from London would make it difficult, and indeed impossible, for him to continue to fill that position. This was a very important meeting, and the circular calling the meeting explained the reasons for which it was called. The mine was now looking better than ever before, but for want of means it was impossible to make those trials which ought to be made. The ground was very extensive, and the eastern portion of the ground was better than where they were now working in, although the ore they were now working was looking well. In the eastern portion they would have several veins to work upon, which had been productive in the deep levels. Mr. Williams from the Van had visited the mine, but the water was in the lower levels, and he could not see them, but he said that if the workings were like what they were represented to be the company had a good property, and all that was wanted was capital to work the eastern portion of the ground, and if they worked the eastern portion they would unwater other portions of the ground where they had now to lift the water. They could get to the eastern portion by driving a level, but the shareholders must all see that if they left the directors without sufficient capital it was impossible to carry on the mine properly. The directors had been advancing money to a considerable amount, and did not think they were justified in going further; the shareholders would reap the benefit of it, and the directors might be losers by it. It was scarcely fair to call upon the directors to advance money from time to time when they had a property of this kind before them. There would be raised this month about the same quantity as before, which would produce about 25 tons of lead when milled, without the royalty. That lead would have been smelted before had the bellows not broken. It seemed there had been great difficulty in getting the bellows mended, and a man was coming down specially to do it at a cost of about 30*l*. The lead ore was there on hand, but it could not be smelted till this necessary repair was carried out.

A SHAREHOLDER: Have two of the directors resigned?——The CHAIRMAN: No, Mr. Batters has resigned and Mr. Carr is unwell.

Mr. F. MANSELL: Which level do you refer to when you say there is a difficulty about it?——The CHAIRMAN: The Perseverance level, but the parties who had it have given up the trial, and now we can get possession of it.

Mr MANSELL asked at what depth it would bring them under the workings in the 30 east?——The CHAIRMAN said it would lay open about 30 fathoms of whole ground; the first vein east which would be got would be the Water-hole vein.

Mr. MANSELL: Would that, in your opinion, be the better way of working the mine, instead of sinking a shaft on the Sunnyside?——The CHAIRMAN said the eastern portion was unwatered by the Eagle level. The old company sunk 32 fms. below the Horse level, and it was as dry as that floor. There were open gulfs to take away the water. He recommended the shaft to be sunk from the surface on the top of the Horse level, and then drive and cut the face where there were veins coming together, and it was the impression of old miners that there would be a rich mine if that were done.

Mr. MANSELL: And if you sink the shaft you will raise almost sufficient ore to meet the cost?——The CHAIRMAN: No doubt we should reach ore before we get down to the Horse level.

The CHAIRMAN, in answer to a further question, said he thought it would be better to have a small steam-engine, and even supposing they got no ore the cost of the steam-engine and sinking would not exceed 1500*l*.

In reply to a further question by Mr. MANSELL, the SECRETARY said it was estimated that it would cost about 1500*l*. to open up the eastern portion of the ground, independent of the Perseverance level.

The CHAIRMAN: Mr. Williams recommends that there should be a small engine got to draw the waste to the surface and the ore come out of the level mouth, and, including that, it will cost about 1500*l*., provided we met with no ore in sinking. We should sink on the face for a considerable distance.

Mr. MANSELL said he believed the mine was only 900*l*. in debt.

The SECRETARY said that was so.

Mr. BAXTER (a director) said their present position was that they owed 846*l*., exclusive of interest: there was the April cost 366*l*., bringing it to 1212*l*., against which they had 59*l* in the bank and 40*l*. arrears of debentures, which would make it 314*l*.; there was the lead ore raised for April, estimated at 400*l*., which would give assets 674*l*., as against liabilities of 1212*l*.

The SECRETARY: We have 1200*l*. liabilities and 500*l*. of assets.

Mr. BAXTER went on to say that the directors had no money with which to meet current expenses. There was no doubt the company had been in difficulties from the time of its inception; it never had a proper capital. It was begun with very inadequate means of working. When the company was in good repute, and looked upon as very favourable, the shares were at a premium, and there were 1000 shares held in reserve which might have been realised, and have put the company in a sound financial position, and had that been done he had not the slightest doubt, in his own mind, from what they knew of the property, and what he had seen of it, that instead of being now in this unfortunate strait the company would have been in a first-class dividend-paying state. He believed they had a property hardly second to any in England. As he had said, they began with an inadequate capital, and his impression was that that inadequate capital was not expended in the early days for the benefit of the company; however, it was expended, and the company was left high and dry without capital, and had been struggling on with these difficulties ever since. Even the small sum which Mr. Hutchinson had called their attention to over and over again—the 30*l*. for the repair of the bellows, they had been unable to afford to spend. The company had been going on in debt, and the directors had been raising money upon their own liability in the interest of shareholders, and they had done so because they did not like that the property should be abandoned, or that there should be a risk of shareholders, who had paid large sums for their shares, losing their money. He paid 7½ for every share he held, he had subscribed for double his proportion of the debentures, and had done everything he felt he ought to do either as a shareholder or a director. He hoped the shareholders themselves would never allow, for so small an amount as was required, such a valuable property as this to escape them. But it was the duty of the directors to be very plain, clear, and distinct with the shareholders to-day. The directors could not and did not intend to go on finding money to carry on the concern if the shareholders themselves would not come forward and find what was necessary to develope their own valuable property. That must be clearly and distinctly understood by the shareholders. There was an amount of about 1600*l*. still unsubscribed. If they could get that—it was a small sum—it would set the mine perfectly free from debt, and render certain the payment of small debenture interest which would be due in July, and would give a few hundred pounds to expend in necessary repairs, for want of which they were losing some 10 or 15 per cent. of lead in the smelting, which in itself was an important item. If they could get the 1600*l*. it would free them from debt, and give a small capital which could be expended in necessary repairs, and enable the directors to more vigorously develope some of the more interesting portions of the mine, and he believed small as the sum was, it would bring the mine into a state of prosperity. The shareholders must now clearly and distinctly understand that it rested entirely with themselves to do all these things. It was a question for themselves whether they would save their own property. There were but two alternatives, one was that the company should be reconstructed, but, with the apathy of shareholders, he was not sanguine that they would come forward and find the necessary capital, and if not the property must revert to the debenture-holders, and the debenture holders (he spoke for himself and several friends who held debentures) would, he was certain, never allow the property to go, but would take it up and find the necessary capital for working. He would gladly do so himself, although he should regret exceedingly to see the shareholders' interest sacrificed. However, he had done all he could, and if the shareholders would sacrifice their interest the directors could not help it. If they could succeed in raising this small balance of debentures and it brought the mine into a fairly successful position, he thought there would be no difficulty in forming a new company to work the eastern portion of the sett, which would find ample capital for the present company to carry on operations with energy and vigour, and bring it into a successful position. The old workings now had been passed, and Capt. Williams had referred to the great importance of the Rake vein, regarding which he stated in his report, "This point is the long length of unexplored ground before us (one mile), and the great height of backs (35 fms.), and should this course of ore continue as at present, the future prosperity of the mine is established." He hoped the shareholders would see the desirability of coming forward and saving their own property.

A SHAREHOLDER: If the debenture-holders do not come forward as well as the shareholders, what do you propose to do with the mine? Is it saleable?

Mr. BAXTER: I apprehend that if the company default in the payment of debenture interest the debenture holders, as the mortgagees, come into possession.

The SHAREHOLDER: Can they sell the mine?——Mr. BAXTER: They can take possession of it.

The SHAREHOLDER: It is no use taking possession of a mine which wants so much money put into it.

Mr. BAXTER: That would be the business of the debenture holders. If they did not wish to put more money in they would not do it, and if they did put it in they would do it at their own risk.

The CHAIRMAN, referring to the mode in which the original capital was expended, stated that the first year they took possession of the mine it was a wet season—so wet that, try all they could, they could not keep the water out; therefore for 12 months they were struggling with the water, and were raising no lead. There were other parts of the mine where the levels were closed, owing to want of capital, but if they had been kept open there were many men out of employment at the time who would have raised ore at a price which would have left a certain profit.

Mr. BAXTER said there was another point to be borne in mind, and that was the low price of lead. If lead was at anything like the price it was 12 months ago they would be making a very good profit now, and paying a fair dividend. But it was a matter over which the directors had no control, and it was one of the misfortunes with which they had to contend.

A SHAREHOLDER asked how far during the last six months had the proceeds of the lead fallen short of the estimate?——Mr. KITCHING (a director) said that since the last meeting they had sold pig lead worth 1524*l*., and the cost had been 1920*l*., and he did not consider that an unsatisfactory state for the mine to be in, trammelled as they were for want of funds. It had been proved that they had a mine which could be worked to a profit if a sufficient amount of capital were provided to lay it open. The directors had been advancing money on their own personal liability, but they were not inclined, either individually or as a board, to go further, and they thought the shareholders should take the burden upon their own shoulders. As an ordinary shareholder, he should be sorry to see the property lost, and for so small an amount, but undoubtedly it would be lost unless the shareholders as a body took up the balance of the debentures. He mentioned that letters had been received from some of the shareholders offering to take up some 105*l*. worth of debentures, and he hoped the other shareholders would determine to take up their portion of the debentures which were still unallotted. He did not know what latitude could be given as regarded time, as the matter was pressing, and one which they must face in a business like way.

A SHAREHOLDER: I think the produce in November was 30 tons, so if we had gone on till the end of last month we should have produced 180 tons of pig lead.

The CHAIRMAN said that was so, but there was one month when they did not work at all.

A SHAREHOLDER: Many persons go into a mine in the same way as persons go into *roulette*—they will put so much in, and no more.

Mr. MANSELL said the general opinion amongst those who were acquainted with the property was that this was a great mine, and only required a small amount of capital to work it into a valuable property.

The SECRETARY: I saw Capt Williams about a month ago, and he said that if a little capital were found to work it no richer mine would be found.

Mr. MANSELL: All it requires is a small amount of capital. The debt on the mine is small compared with many mines. Your liability for a mining company is very small. As a debenture holder I should very much regret if the shareholders did not come forward and save the property.

The CHAIRMAN, in reply to a remark, said all the bills were paid every month. The pay was due to the men on Wednesday next, and if they were not paid they would not do another stroke of work.

Mr. BAXTER, replying to an observation, said they had not been in a position to do any work of exploration, but drive where they could get paying ore.

The SECRETARY said there was one important feature in connection with the mine worthy of note—wherever the mine was said to be rich, whenever that point had been reached they had invariably found it to be so.

The CHAIRMAN said that, even with the present low price of lead, in the past month they had made a small profit after paying all expenses.

The SECRETARY: With a further development we could raise a larger amount of ore, and even supposing the price of lead to remain as it is, we could make a good profit.

Mr. BAXTER said that if they could get the concern into thorough working order they might be able to sell the eastern portion of the mine, and then thoroughly develope the other portion. He added that the directors would find the money to defray the coming cost sheet, but they could not possibly go any further in the same direction. He suggested that a circular should be sent to the shareholders informing them of the present position of affairs, and giving them a fortnight in which to signify their intention to subscribe or otherwise to the debentures.

Mr. BAXTER, in answer to a question, said the expenses for April were 360*l*., and the expenses might be taken roughly at 360*l*. per month.

A short conversation ensued, and in the end it was understood that a circular would be sent at once to the shareholders informing them of the exact position of the company's affairs, and inviting them to subscribe for the debentures.

A vote of thanks to the Chairman and board closed the proceedings.

WEST CHIVERTON MINING COMPANY.

A general meeting of shareholders was held at the offices of the company, Basinghall street, on Thursday,

Mr. T. SMITH, of York, in the chair.

Mr. GRANVILLE SHARP (the secretary) read the notice calling the meeting.

The CHAIRMAN moved that the balance-sheet be received and adopted, errors and omissions excepted. The directors regretted that it was not of a more favourable character, but that it was not so was not from circumstances over which the directors had any control. It arose from the continued depression in the lead and blende market, prices having fallen month after month from bad to worse. To give them an idea of this he might mention that the average price for the sale of lead for the four months ending November, 1876, was 13*l*. 19s. 7½d. per ton; for the four months ending February, 1877, it was 12*l*. 12s. 8d. per ton; for the five months ending July, 10*l*. 17s. 7½d.: for the four months ending November, 10*l*. 3s. 6d.: and he was sorry to inform them that it was now only 8*l*. 11s. 3½d. per ton; the difference therefore, between the price at the present time and at the corresponding period of last year was 4*l*. 1s. 5d. per ton, making a difference on the returns of upwards of 2000*l*. If they could have secured anything like their former rates they would have had more than a sufficient balance to pay the usual dividend of 10s. per share. The blende was less by 290 tons for the last four months, but was 40 tons over the same period last year; the amount last year was 4049*l*., but now with a larger quantity it was only 3366*l*. There was on the mine a large accumulation of blende, worth at the least from 30s. to 40s. per ton, dressed and cost paid, for which at the present time there was no market whatever. If they had been able to make a return for this blende, even with the reduced price of lead, they would have still been able to pay a dividend; but they had the blende in stock, and they hoped at some future time to sell it for its market worth. The monthly costs were rather over the average by 393*l*., compared with the same period of last year. The directors hoped that the present low prices of lead were exceptional. They had carried on the work of sinking, driving, and exploring, considering this was the best policy for the future benefit of the company. The tutwork done last year was 1368*l*., and this year 1768*l*., being an increase of over 400*l*. in that item. Although the prices were so bad the directors did not see their way to recommend any reduction in that direction. This great depression in price and violent fluctuations were regretable, but the changes to which trade was liable could scarcely by any foresight be avoided. These times of depression and dulness were as surely succeeded, as night and day, by periods of healthy trade and activity, especially when the known causes of depression are removed. No doubt three or four of those causes were inflated prices, extravagant wages, and strikes, followed by three of the worst harvests known in succession: and last, but not least, there was the war cloud hanging over the country for the past twelve months. These, more or less, in their way had contributed to the present disastrous price of mineral. He was glad to say that the prospects of a bountiful harvest were never better, and with the blessing of peace, and with cheap money, and a reasonable rate of wages, they might hope for a natural reaction and better prices. To meet the present exceptional times, the committee had agreed to forego their fees until better prices for minerals were obtained; he was also glad to announce that the agents had agreed upon a very substantial reduction in their salaries upon the same condition. The directors also hoped to make a considerable reduction of expense by the introduction of anthracite coal. He believed the saving effected by this would be something surprising. The ends were now worth about 70*l*.; last time they were worth 100*l*., but this was simply because of the reduction which was made in the valuation. They continued to return and turn over a large quantity of mineral weekly. The new crushers turned over 2000 tons per month at a cost of about 6*l*. per ton, which was a large amount to turn over. He proposed that the balance sheet be received and adopted, and that a credit balance of 1166*l*. be carried forward to next account.——Mr. BRAITHWAYTE seconded the resolution, which was put and carried.

Capt. SOUTHEY then read his report as follows:—

May 14.—Batters's Engine-Shaft: This shaft is now within 9 ft. of the 170; the main part of the lode, we believe, has gone off in the north side or footwall of the shaft, from which a great deal of water is issuing. When the 170 is reached we shall immediately cross-cut to ascertain its size and value, which, judging from what we have opened in the 160, will be very favourable. In the 160, west of shaft, the lode is 4 ft. wide, worth for lead 15*l*. per fathom; in this level, about 35 fathoms west of shaft, we have cross cut north and intersected the north lode, and opened on its course about 15 fms west and 5 fms. east, the lode averaging for the whole drivage 3½ ft. wide, and worth for lead and blende 12*l*. per fathom. In the present ends the lode is fully 4 ft. wide, and worth for lead and blende 10*l*. per fm. In the 150, east of shaft, the lode is 2 ft. wide, worth for lead 5*l*. per fm.; here, in about 10 fms. further driving, we expect to meet with the shoot of lead gone down in the 140, at Hawkes's shaft, and on which we opened in that level fully 40 fms.; when this is met with the value of this part of the mine will be considerably enhanced. The lode in the 130, east of shaft, on the north lode, is 4 ft. wide, worth for lead and blende 12*l*. per fathom The 100 is extended 15 fms. north of shaft; no lode or branch of any value has yet been intersected.

Hawkes' Engine-Shaft: In the 140, east of shaft, the lode is 2½ ft. wide, worth for lead 10*l*. per fathom. In the 140, west of shaft about 10 fms., we have just commenced to sink a winze in the shoot of lead previously alluded to, where the lode is 3½ ft. wide, and worth for lead 12*l*. per fathom. Surface operations are being carried on as cheaply as possible, and at our new crusher we are treating about 2000 tons of stuff monthly, at a cost of 45*l*. per month, or a little less than 6d. per ton; this includes coal, oil, grease, and labour. In conclusion, we are sorry to see the prices of lead and blende so low, but are pleased to inform you that the prospects of the mine, provided former prices can be obtained, are quite as well as for some considerable time past.—RICHARD SOUTHEY, WM. ROBERTS, JAMES MOYLE.

On the motion of the CHAIRMAN, seconded by a SHAREHOLDER, the report of Capt. Southey was adopted.

The CHAIRMAN remarked that no stone was left unturned to reduce the expenses in every possible way, and he might mention that the secretary had reduced his salary three guineas per month, and the manager had done even more than that. Everything possible was also done to widen the market for the lead. He moved that the report of the meeting be received and adopted, and circulated.——The resolution was seconded and carried, and a vote of thanks having been passed to the Chairman, the meeting broke up.

CATHEDRAL MINE.—At the meeting, held on Monday, it was agreed to register the new company for re-working this mine forthwith. The registered office will be at Mr. Ashmead's, 62, Cornhill.

EAST CARADON.—At a special meeting of the adventurers, held at Salisbury on May 8 (Mr. William Fawcett chairman), the reports of Capt. Holman, of South Caradon, and Capt. Josiah Thomas, of Dolcoath, were read, and considered highly satisfactory, when it was unanimously resolved that the sinking of Williams's shaft should be continued to the 150, and the cross-cut driven to the shaft with all possible speed. Good results are expected in the course now being taken.

EAST CHIVERTON.—A general meeting of shareholders was held at the office, Gresham Buildings, Basinghall-street, on Thursday, Mr. Edward Hilton in the chair. The accounts showed that the debit balance was 503*l*. 5s. 10d. After some conversation a call of 5s. per share was made. A resolution was passed authorising the secretary to write to those shareholders who are in arrear of call.

WEST WHEAL SETON.—A circular pointing out some apparently serious irregularities connected with this mine has been forwarded to the shareholders by Mr. William Bennetts, of the Roskear Fuse Works. The circular states that the committee are—Mr. Thomas Pryor, the purser; Mr. W. H. Rule, general merchant and share-dealer; Mr. H. T. Maine, grocer; and Mr. John Williams, mercer and tailor. Two of these gentlemen—Messrs. Rule and Williams—work a portion of the tin dressing-floors on tribute at 12s. 6d. in 1*l*. under contract made by the late Capt. Josiah Thomas, who, however, had his own agent on the mine to look after the shareholders' interests. Since the change of management the committee have exercised sole control, and there is no one to represent the shareholders as against Messrs. Rule and Williams, under agents being unlikely to notice irregularities. Mr. Bennetts asserts that the copper precipitating was never legally granted to Messrs. Rule and Williams, and that 4 tons sold at 12*l*. to 14*l*. per ton as "Rule's Precipitate" and "Williams's Precipitate" should have been sold for the mine, but that nothing appears in the mine accounts respecting it. Mr. Bennetts adds that Mr. Williams has owed since January, 1877, the date of the last call, 140*l*. on his 19 shares, which at 5 per cent. interest alone would have yielded the adventurers 8*l*. 15s., and that by the Stannary law he is not eligible to be a member of the committee. Capt. S. Terrill, one of the most active agents under the committee, carried on business as a grocer not a great distance from the mine, which is prohibited by the Stannary Act, and calculated to prove prejudicial to the adventurers; Mr. Bennetts thinks he should be removed. Competent agents who have inspected the mine tell Mr. Bennetts that it is a productive and valuable property if properly worked and judiciously managed, and he recommends that the adventurers appoint a thoroughly experienced and practical agent as manager to devote his time to the mine. In a letter accompanying the circular Mr. Bennetts states that Messrs. Rule and Williams have the power to order the tin to be sluiced from the mine dressing-floors to their own dressing-floors if they think fit, and there is no one on the mine who dares give them a denial.

KILLIFRETH.—In spite of the unparalleled depression which prevails in metallic mining, this mine seems determined to come to the front, and to afford another proof that even under adverse circumstances sound mining speculation is not easily deprived of its elasticity. It is not long since it was seriously feared the mine must, like numbers of others, succumb to the overwhelming influences of the general depression, although its prospects seemed to give every assurance that only a little more time to acquire greater depth was needed to make it a success, and the works were continued with unabated vigour; it is pleasing, therefore, to be now able to record an important improvement in the 70 (the bottom), where the lode is opening up rich tin ground, which justifies great hopes that the depth at which profitable deposits have always been expected is now being reached. Looking at the general prospects of the mine, it is not too much to say there is every reason to anticipate Killifreth will prove a prize, and give the world another instance of the enormous fructification which follow a successful realisation of Cornish mining speculation.

GREAT WHEAL ELEANOR (North Bovey).—This mine seems to have lived remarkably well through good and ill report, and the present proprietors (notwithstanding the unprecedented low price of tin) are in a fair way to reap the reward of their untiring zeal and perseverance. There are many points in favour of the mine which renders its development very cheap, and had not the first management spent so much on surface erections there is very little doubt that ere this the Great Wheal Eleanor would have been found amongst the dividend-paying mines, but the shareholders have little else to do than congratulate themselves on the present and future prospects of the mine. This is shown by the fact that some months back timid holders were glad to get their interest off their shoulders, whilst now shares are bought at within a few shillings of par. This great change, even at such a time of depression, is quite consistent with the greatly increased value of the mine, for, according to the report of Capt. Josiah Thomas, who has inspected it twice, there is little doubt the shareholders have not spent their money in vain. Capt. Thomas, in his report, says—"Since my last visit the mine has improved very considerably, a shaft has been communicated from the surface to the adit, west of the engine-shaft, and the adit driven 38 fathoms beyond it. In this latter driving the lode has very much improved in quality, as I had hoped it would on being driven on under the more extensive workings of the ancients. Some very rich stones of tin can be seen in the lode left standing, and as near as I could ascertain the lode for the last 16 fathoms had produced about 3 cwts. of black tin per fathom, or worth at the present low price of tin 5*l*. 10s. per fathom, whilst the cost of driving is only about half that amount. I see no reason why the lode should not continue productive, and if it is found to be only of the same value as that which has been driven through of late something like 5000*l*. worth of tin ground will be laid open for stoping above the adit level. It is important that the adit should be driven as nearly horizontal as practicable in order to obtain the greatest possible amount of backs. I venture to mention this because I think sufficient attention was not formerly paid to this point, and, although I had no means at hand of levelling the adit, I should judge from its appearance that some fathoms of backs have been lost already by the adit having been allowed to rise more than was necessary, and so much less tin ground will consequently be available for stoping. I think you cannot do better for the present than confine your attention to the driving of the adit westward on the course of the lode, by which you will be able to ascertain its value at a comparatively small outlay, and after a few months you will see what amount of tin ground you have laid open for stoping, and decide on the best plan of taking it away and preparing it for the market to the greatest advantage. The price of tin is not likely to go much lower than it now is, and may probably be higher towards the latter part of the year, so there is not much risk of your losing anything by not stoping the ground just yet, but continue driving. If another shaft should be required for ventilation it would not cost much to sink if from the ancient workings, but I do not see that this is absolutely necessary yet. Besides, even richer tin ground may possibly be met with further west, in the midst of which a shaft could be sunk with still less outlay."—Capt. Thomas has dwelt upon many other interesting features of the mine, and has given much valuable advice as to economical working, and it is most satisfactory that the directors call in the services and invite the criticism of our best mining authorities; it shows at least that they are anxious to know from independent sources what progress they are making, and it is upon fair and reasonable grounds that the Great Wheal Eleanor may be considered as rapidly working its way to a dividend-paying condition.

MINERAL RESOURCES OF NEW SOUTH WALES.—A handsome chromo-lithographed "Geological Map of the Districts of Hartley, Bowenfells, Wallerawang, and Rydal," New South Wales, has just been issued by the Department of Mines at Sydney, and we have been favoured with a copy through Messrs. Trübner and Co., of Ludgate Hill, the agents for the Government publications in this country. The map, which illustrates the extent and thickness of the mineral deposits in one of the most promising mining regions of Australia, is from the geological surveys made in 1875 by Mr. C. S Wilkinson, F.G.S., Government Geologist, assisted by Messrs. J. J. Baylis, field assistant, and H. Wilkinson. Commencing with the Hartley Vale platform on the Great Western Railway, 80 miles from Sydney, and 3318 ft. above sea-level, the large mass of upper coal measures through which the line passes is shown, and it is mentioned that the district embraces the upper coal measures which crop out in the lower portions of the valleys, overlaid by from 300 to 500 ft. thickness of Hawksbury sandstone, forming high precipitous escarpments. This sandstone is traversed in all directions by veins of concretionary brown iron ore, fragments of which in considerable quantities lie

scattered over the surface of the ranges. The coal measures have a general dip of from 2° to 5° towards the north-east. The formations to the west and south-west of these deposits, which embrace the lower coal measures, Devonian, and granite rocks, are all carefully shown as far as Falnash, the western portion taking in from the Rydal railway station on the south to beyond the Wallerawang Company's mines on the north, the coal from which is mentioned as being of excellent quality, and suitable for all purposes. The map will be invaluable in Australia, and extremely useful to a large number in this country, especially as the Wallerawang and neighbouring districts have long been regarded as a favourable field for English enterprise.

FOREIGN MINING AND METALLURGY.

The Russian Government has recently appointed a commission to consider the railway tractive resources of Russia in the event of war. It is believed that 1650 trucks of grain could be moved daily. The number of trucks required to keep up deliveries at this rate would be 41,000; the stock of trucks actually possessed is 85,000. The number of engines required to perform the service indicated is estimated at 2127; the stock actually possessed is 4100.

In the Belgian iron trade contracts continue to be very keenly competed for, and important transactions are few and far between. Quotations are still declining, upon the whole; this is shown by recent official adjudications. Industrials naturally raise the question, "When will this almost continuous decline in prices be arrested?" A contract for rather a considerable lot of gas-pipes has just been let at Termonde at 5*l.* 3s. per ton. The rates current for old materials are also as low as they well can be; thus a lot of 25 tons of old iron has been purchased from the Belgian State Railways by M. Goffin at 2*l.* 4s. per ton. The report of the Great Central Belgian Railway Company for 1877 shows that 17 per cent. of the expenses incurred by the company during the year in its "loco" department went for wages, 30 per cent. for fuel, and 37 per cent. for the repair and maintenance of locomotives and tenders. The number of miles run annually by the company's engines has doubled during the last twelve years. The average cost of the fuel consumed last year was 9s. 11d. per ton, or nearly 1s. 8d. per ton below the corresponding price in 1876. At the commencement of 1877 the average "age" of each of the passenger engines was 75,000 miles; that of the goods engines was rather less.

The Belgian coal trade has remained weak. The contracts for coal which have just been let by the Administration of the Belgian State railways exhibit an average decline of 2d. per ton as compared with the prices current at the last previous adjudication; this is another indication of the depression to which the trade has been reduced by reason of the dearth of business which has prevailed of late. Freights from Belgium to Paris remain at 5s. per ton, the deliveries of Belgian coal made to the French capital being comparatively unimportant at present. The brickmakers have almost entirely completed their supplies for the season; there has, accordingly been a falling off in the qualities of the coal consumed by them. There has been some discussion of late as to the desirability of establishing a national Belgian agency in the Argentine Republic, in accordance with a project elaborated by M. d'Hane-Steenhuyse.

A slight improvement noticed a few days since in the iron trade of the Haute-Marne district has been pretty well maintained. Coke-made iron for reassortments has sold at 7*l.* per ton, and good mixed iron at 7*l.* 16s. to 8*l.* per ton. These prices are accepted notwithstanding a fall which is reported to have taken place in the French department of the Nord, but which is not general in the works of that group. At the same time it must be admitted that the offers of iron made from the Nord have completely checked the sale of iron upon the Paris market, except for some descriptions of iron which Champagne alone furnishes, or which it furnishes better than any other locality in France. Pig has been in comparatively little demand at St. Dizier; pig for refining has been disposed of with some difficulty in small lots at 4*l.* 5s. 9d. to 4*l.* 8s. per ton. As regards pig for recasting No. 3 remains at 3*l.* 8s. per ton. Second fusion pig has been dealt in in the Meurthe-et-Moselle as regards lots of from 500 to 1000 tons each at 3*l.* per ton for No. 3. First-class coke-made iron has made 6*l.* 10s. to 6*l.* 12s. per ton in the same district. Upon the Lyons market ordinary iron remains at 7*l.* 4s. per ton; upon these terms business lacks animation. The works are receiving comparatively few orders, as both railway companies and the building trade show much reserve in their purchases.

FOREIGN MINES.

ST. JOHN DEL REY MINING COMPANY (Limited).—Advices received May 4, 1878, ex Minho (s.), dated Morro Velho, April 2:—

GENERAL OBSERVATIONS.—The produce for the second division of March, a period of eleven days, amounts to 14,283·3 oits. = 1650·8677 ozs troy. It has been derived as follows, viz.:—

	Oits.		Tons.	Oits. per ton.
General mineral	6,872·5	from	1240 =	5·542
Mineral free from killas	5,398·3	,,	811 =	6·656
Praia	1,279·7	,,	274 =	4·670
	13,550·5	,,	2325 =	5·828
Retreatment	682·8	,,	— =	·293
Total	14,233·3	.....	2325 =	6·121

Equal to 1650·8677 ozs. troy = ·7056 ozs. per ton.

The above produce is a slight improvement on that obtained during the first division, both in yield per ton and the quantity extracted per diem.

Advices received May 15, 1878, ex Tagus (s.), dated Morro Velho, April 18:—

GENERAL OPERATIONS.—The gold produce for the month is higher by 4514 oits., with an improved yield per ton of 0·706 oits. compared to the return for February. The increase is due to the better class of mineral raised from stopes "A" and "B" 255 during the last division of the month, the produce per diem for that period being at the rate of 1427 oits.

In the mine fair duty has been done, and there is little or no change to note in either the eastern or western sections.

GOLD PRODUCE FOR THE MONTH OF MARCH.

The gold extracted during the above period amounts to 41,433·1 oits., equal to 4776·5624 ozs. troy. It has been derived as follows, viz.:—

	Oits.		Tons.	Oits. per ton.
From general mineral	19,748·0	from	3473 =	5·686
,, ditto Praia	3,540·7	,,	746 =	4·746
,, mineral free from killas	16,174·8	,,	2265 =	7·141
	39,463·5	,,	6484 =	6·087
Retreatment	1,969·6	,,	— =	0·303
Mexican arrastres	43·6	,,	— =	·005
Total	41,476·7	,,	6484 =	6·395

REDUCTION DEPARTMENT.—The above produce is at the rate of 1386 oits. per diem, a good return considering the mixed nature of the mineral treated. The daily average mill duty—188·92 tons—is a trifle under former returns, owing to the large admixture of quartz. The total quantity of amalgam produced was 93,528 oits., which yielded gold to the extent of 44·30 per cent. Of amalgamated sand treated there was an increase of 512 cubic feet.

AT THE PRAIA the results continue to be satisfactory, the amount of mineral and tail sand treated and the gold therefrom derived steadily increasing. The new appliances for an extended treatment of the refuse sand are now completed, and require but a few unimportant additions and alterations before being permanently put to work.

COST AND PROFIT.

The produce for March being ...	41,476·7 oits.		
Less loss in melting ...	177·6 ,,		
	41,299·1 at 7s. 9d. per oit. =	£16,003	8 0¼
Cost		7,560	7 1
Profit for the month of March		£ 8,443	0 11¼

MINE.—Mineral raised from mine ..... 7092 wagons.
Mineral quarried per borer per diem ..... 2·03 ,,
Average number of borers daily ..... 134·11
Average number of natives daily ..... 206·46

SUMP.—The supply of mineral therefrom has been fairly maintained, with no special change to advise in either the size or quality of the mineral body—the width of pure contents 22 ft., highly charged mineralised quartz and killas 13 ft.—in all 35 ft.

278 "B" embraces the new stope adjacent to sump referred to in the January report. At this point the width of the excavation is larger, owing to an indent in the south wall. At a lower horizon there is an increase in the more northerly bearing of the wall. From this stope a large extraction may be expected, the width of the pyritic body being 34 ft.

278 "A."—At this section there is a slight decrease in the mineral width, the present line of the stope westerly having reached a contracted part of the excavation, owing to a swell of killas from the south wall. East and west of this point the lode maintains its former size, and the mineral therefrom raised quite equal to any of the preceding months.

LEVEL ABOVE SUMP.—There is no improvement to note in the forebreast of the driving, the mixed mineral contents being still contracted and poor. From the stope a fair output has been obtained, and its general appearance is without change.

EASTERN DRIVING UNDER ROOF.—STOPES 217 "C" AND 237 "A."—There has been a slight increase in the supply of mineral from this level, the width of productive lode being somewhat larger. The advance made during the month is small, owing to the continued hardness of the rock.

AT THE STOPES the month's operations have been confined to section 217 "C," or upper part of the stope. Owing to its overhanging position the amount of mineral extracted is less, the lode at this point not being so productive as at a lower horizon.

277 "A" and "B" are without change.

WESTERN SECTIONS 255 "A" AND "B."—Nothing has occurred to alter the expectations formed as to the extension in length and depth of the lode in this direction. The same favourable indications continue, the average width of the pure and mixed contents being quite 40 ft. The intrusion of the quartz floor has temporarily reduced the quantity of pure mineral; that on the south side has to some extent been removed, but there still remains a large body to be taken away before an increased amount of better mineral can be looked for.

284 B.—The output of good mineral from this section has been also limited, owing to same intrusion of quarts as that met with in 255. Towards the end of the month the containing proportions of pyrites in the quartz increased, and the general indications are such as to lead us to expect an early improvement.

THE WESTERN LEVEL has been advanced 7 ft.; present bearing due south. On the north side the proportion of quartz and killas is larger, with a corresponding reduction in the pure mineral contents on the south side. As soon as the south wall is reached steps will be taken to ascertain more fully the extent of the mineral body to the north.

"A" CROSS-CUT.—Contrary to expectation there is no notable alteration in the water pressure issuing from the tap. This may be partly attributable to the increased surface drainage, consequent on the rainy season, or that the upper discharge cocks have not fairly communicated with the old excavation.

B SHAFT sunk 11 ft. 2 in.; this is the best duty yet done. The Darlington drills have been under repair, but will again be worked in the course of a few days.

GOLD EXTRACTED TO DATE.—The produce for the first division of April—a period of eight days—amounts to 9730·5 oits., equal to 1121·7683 ozs. troy. It has been derived as follows:—

	Oits.		Tons.	Oits. per ton.
From general mineral	4,630·4	from	808 =	5·731
,, ditto Praia	729·3	,,	190 =	3·838
,, mineral free from killas	3,889·0	,,	614 =	6·334
	9,248·7	,,	1612 =	5·738
Retreatment	481·8	,,	— =	·199
Total	9,730·5	,,	1612 =	6·035

There has been a greater quantity of quartzose mineral treated during this division, which explains the lower yield of produce.

MINE.—The return for the first fortnight of April, embracing a period of thirteen working days, is as follows, viz:—

Mineral raised from the mine	3379 wagons.
Mineral quarried per borer per diem	2·06 ,,
Average daily attendance of borers	126·00
Average daily attendance of natives	202·23

The output of mineral is a trifle lower, due to repair work of the mine shoots. The duty per borer shows an increase.

No change to advise in either the western or eastern sections.

The gold troop was dispatched on the 12th inst., taking 49 bars of gold, weighing 76·810·3 oits. = 8854·9 ozs. troy, or 737·9 lbs. troy. N.B.—The gold has duly arrived.

The following telegrams have been received:—On April 6—"Produce eight days (first division of April), 9750 oits.; yield, 6·0 oits per ton."

On April 29—"Profit for the month (March), 8400*l.*"

On May 3—"Produce eleven days (second division of April), 12,750 oits.; yield, 5·6 oits. per ton."

On May 10—"Produce for month (April), 36,000 oits.; yield, 5·6 oits. per ton."

DON PEDRO NORTH DEL REY.—Report for March: Produce, 1923*l.* 19s. 6d. Cost, including all general expenses, also cost of labour and materials, amounting to 256*l.* 3s. 4d. for erection of permanent pumping machinery), 2483*l.* 7s. 11d.

— Capt. Vivian, April 18: Produce cleaned up, 1478 ozs.—Permanent Pumping Machinery: The machinery throughout works splendidly, and to let you know of this as early as possible I have thought proper to telegraph "all's well." Telegram from Rio, dated May 9, referring to a later date than the above report, advised 3050 oits. for the month of April.

SANTA BARBARA (Gold).—The directors have not received their usual advices from Brazil by the Southampton packet.

PITANQUI (Gold).—Mr. T. S. Treloar, March 30 and April 16, advises that the adit had been extended to a total distance of 104 fms from the mouth of the same at March 31 last, but owing to the ground having again become excessively hard, the drivage for April would probably hardly equal that for March. A small shaft to serve primarily for shallow explorations, and hereafter for ventilation, &c., which would strike the adit vertically at a distance of 148 fms. from mouth of latter, had been sunk 6 fms., but temporarily suspended, owing to the force being required for the harder ground in the adit. This shaft upon reaching virgin jacotinga, probably at a depth of some 24 fms. from surface, is intended to be contained on the underlie to the adit, when small exploratory levels will be driven in the direction of the Ouro Podre and other veins. The Ouro Podre vein has not been wrought upon during this century, but from what is already seen it is manifest that extensive workings were carried on at one time on this vein of gold. The former owners followed the vein down until they were overpowered by water, and to that depth it must have been rich, for a determined effort was then made to drain the mine. The adit now being driven by the company having been commenced and advanced 10 fms. (20 yards) into hard rock by means of picks and wedges only, there being no vestige of a borer hole to be seen anywhere in that distance, Mr. T. S. Treloar further states that in going over the old workings of the mine he has been surprised at their magnitude and extent, and the conclusion is irresistible that down to water level great quantities of gold must have been found, otherwise such extensive workings would never have been carried on.

RICHMOND CONSOLIDATED.—Telegram from the mine at Eureka, Nevada: Week's run, 880,000, from 1070 tons of ore. Week's produce of refinery, $70,000.

— R. Rickard, April 22: I have been in this place (Oakland, Cal.) a week, and shall probably remain one week longer; consequently you will not receive any report of the mine from me for last and this week. I hear frequently from the foreman of the mine, and his reports to me are very satisfactory. Everything is looking very well. As soon as I return to Eureka I will forward a full report of all the workings.

FLAGSTAFF.—The directors have received the following from their manager: Largest body of good ore in the mine struck in the fifth level, 700 ft. north-west of shaft, lowest point of working in the mine. Output for past month, 1500 tons. Ore sales for 20 days of same, $22,200. New machinery working well.

MINERAL HILL.—Mr. Plummer, April 22: Queen Tunnel: Progress during the week, 4 ft. 6 in. The present end looks much the same as when last reported on. There will be no work performed here during the present week, as I have put the men in the South Giant to hasten the communication between that mine and the Star Mine.—Star Mine: The little body of ore on the east side of the Queen chamber has given out, and we have broken but little during the past week.—Troy Winze: We have cut across the vein at this point, and find it to be about 5 ft. in width. There is no ore visible, and we have resumed sinking the winze.—South Giant: The men are making fair progress in communicating with the Star, and are breaking more or less ore. On account of the ore giving out in the lower part of the Queen chamber, we are pushing the work so as to continue breaking ore.—Frances Mine (late South Troy): The branch reported here is gradually growing wider. The ground is still very hard for breaking, and we do not make the same progress as I could wish. This mine is immediately opposite the Republic, and is a continuation of the Star or Silver Queen series.

JAVALI.—The managers (April 5) write:—We have very little to report this month, but have the pleasure to send you an excellent remittance; in fact, the second best ever sent.—Mine: 83 varas have been driven in the mine; the remainder of stuff crushed was taken as usual from the surface workings. Everything is in excellent order.—Mill and Remittance: 25 stamps worked 26 days, crushing 2113 tons of ore, yielding 745½ ozs. of gold, making a general average of 7 dwts. 1½ gr. You will see that the quartz has considerably increased in value, and by present appearances we have every hope of the improvement continuing, and of our being able to send you an equally satisfactory remittance by next mail.—Receipts and Expenditure: The expenditure was 1005*l.* 11s. 2½d., including 15*l.* 17s. 5d. for capital account, the remittance is valued at 2000*l.*, thus leaving a balance profit on the working expense of 1010*l.* 6s. 2½d.—Health and Labour: Health not at all good at present; labour sufficient. In accordance with the permission sent by you by last mail, Mr. Chalmers leaves for England by this steamer, leaving Mr. Fairburn to perform his duties during his absence. Upon his arrival in England he will place himself at your disposal for any information required.

OREGON.—Frank Ennis, April 16: I enclose cost-sheet and vouchers for February, also weekly reports for weeks ending March 30 and April 6. Clean-up for February, $1348·58. Should be credited Thoss, $30; Reed, $1048·58. I have to report a very light clean up for March, only 133 ozs. of gold, which will probably net $2000, while the cost sheet for the month is something over $2200. There was no bed-rock cleaned. Thoss claim did not pay more than half-expenses for the month. There is a well-defined channel in this claim, and the gravel looks well, but there appears to be very little gold in it. I shall do but little more work here for the season, further than to clean-up cuts. We can use the water at Reed to advantage, and I think profit.

TOLIMA.—The advices by the mail of the 14th have been received, of which the following is an extract: "We commenced a short sink under the 30 east beneath the Esperanza shaft, and I am glad to say the lode has a promising appearance, and yields some nice ore. Further west the sole of the 30 is very rich. The easterly dip of the ore will throw the richer body of mineral into the Esperanza shaft between the 30 and 40.

BLUE TENT.—D. T. Hughes, April 20: During the past six days it has been raining or snowing some every day, the rains generally very light, all snow on our upper line of ditch; our ditch has not been troubled any this time by either snow or land slides so far, having a full stream running steadily to Tent. Our washing is going on as usual in all the claims, but have added one more monitor to the gopher, making in all six monitors that we have washing with now. Have started three powder drifts on the bottom cement in the South Yuba pit the past week; one will necessarily be short, the others will be of considerable length, but not heavy blasts. This bottom is very hard all over, and without blasting the stream has no effect on it, even when the pipes are moved close up to the bank. The ground broken up by our last big blast is working well, and we are removing a large quantity of gravel daily.

— May 15: The directors have this day received the following telegram from the manager:—Clean-up South Yuba claim $9000.

BIRDSEYE CREEK.—G. S. Powers, April 24: I have this day mailed you cost-sheet and statements for the months of February and March, which I hope you will find quite correct. We exploded a blast in the Neece and West claim on the 21st of 695 kegs of powder, and to all appearances it did splendid execution. The size of the drift was 66 × 122 ft., main drift 60 ft., and the T's 122 under a bank 200 ft. in depth. We have not yet got the extension tunnel at Waloupa in the 100 ft., owing to the rock having been hard and refractory to work, consequently we have not been able to get in any bottom here this month, and have only used the surplus water nightly when it could not be used to advantage at Neece and West claim. My object is to have this claim in shape to run the bought head during the summer alternate with the Neece and West as before stated. I feel confident that this mine will pay a handsome monthly profit from the commencement, when regular water can be run from the bottom gravel. The water season will be a short one for the Birdseye Company ditch, as you will see when I tell you that we have all the water in at the head, and that our ditch is scantily full, but South Yuba will evidently have an over average summer supply, from the fact that the snow in the vicinity of their lakes is deep and compact. There is nothing of further interest to my mind at present that has not been heretofore communicated.

GOLD RUN.—J. A. Stone, April 27: Since my last letter I have not been able to wash steadily, partly on account of work of my own incidental to opening out, partly for the Miners' Ditch Company having to clean up and repair their dams. At the end of 16½ days actual washing my blocks gave out, and I had to clean up and put in new ones. I had no opportunity to run down the ground as close as I intended, the blocks becoming so much worn that while running a large head of water on the bottom (which I sometimes do for an hour at a time to wash the heavy gravel) three boxes of blocks went out, and I had to clean-up at once. As I had not completed the run, I have retorted and put the gold in a bar, and shall not be able to advise the result until I have completed the run; the bar weighs 240 ozs., and will coin at the Mint about $4500, the expense of same has been near $3000, leaving a net $1500. I expect to clean the bed-rock available from the blast during the balance of the run. I have been extending my powder drifts in preparation for a big blast at the end of this run. Mr. J. J. Dunne has sent me a copy of his letter to the directors on the subject of a mill to reduce the bottom stratum of gravel. He also requested me to go and see the mill at my earliest convenience. I shall visit the mill some time in the coming week, and will then give you my ideas of its practicability. I am, however, quite certain that there is not yet sufficient room to set a mill, and will not be until there has been one or two more blasts on the bottom. I am making all possible haste with the opening. The Miners' Ditch Company have washed nearly to our line on the south-east corner, and have struck rich bottom dirt, showing conclusively that the blue lead extends the entire length of our property. I have been to the superintendent of the Miners' Ditch Company and warned him not to wash over our line on the bottom.

CHONTALES.—The directors have received advices from their manager, dated April 5. Nine of the stamp-heads, the leather belting, and some stores had reached the mines, and the remainder was on the way. During the month of March five heads were worked for 20 days by water power, and crushed 250 tons of ore, an average of 5 dwts. per ton. The total cost for the month was 43*l.* Value of the gold, 160*l.*; loss, 27*l.* The above cost included the sum of 22*l.* for extra work at the mines. All operations have been confined to new work and repairs in the reduction departments both at San Domingo and Estrella, for the preparation of the machinery, stamps, floors, and water-power, so as to be in a position shortly to have a full supply of the new stamp-heads at work to be enabled to make immediate and full returns, which I have every confidence will give fair and satisfactory profits.—Estrella Pneumatic Stamps: The new belt has been brought up, and to-day we set the stamps at work. The plates here now seem to amalgamate all right, and I think there can be no mistake but what the stamps will continue to work well. I hope now shortly to finish repairs in the fore part of the reduction works both here and at San Domingo, after which I shall turn my attention to the tailing mill, Wheeler pans, &c., and also to the clearing and development of some of the other mines. I can only calculate on the work of one battery during the month, and that with stamp-heads very small, and not sufficient to do more than half duty. During the past six months we have spent 1029*l.* in extraneous work, repairing mines and machinery. Had these been in working order, instead of charging for extraneous work there would now have been a good profit, but after we are once got right the cost will not be much felt to keep it so, and the mines give now every encouragement for the future.

PORT PHILIP AND COLONIAL (Gold).—Telegram, dated Melbourne, May: Month ending April 24—Gold obtained from company's quartz, 378 ozs.; from tributers' quartz, 1205 ozs. Profit, 1430*l.* Remittance, 800*l.*

PANULCILLO COPPER.—F. G. Welch, March 30: The production amounts to 32,000 quintals metrico at 5 per cent. This is not up to my anticipation, but until more hands come in it cannot be improved. After Easter no doubt we shall be able to get our complement.

PROVIDENCIA AND NEW ROSARIO.—M. V. Cumins, April 14: San Miguel winze has now been sunk 19 varas 35 cts. The lode shows a slight improvement in the yield and quality of the ore, but not sufficient as yet to make it payable unless we can calculate on a great length of stopes. The Englishmen will enter the winze, and as soon as it has reached a depth of 25 varas (68 ft. 9 in.) levels will be driven to try the prospects offered by the lode. The lode in back of San Miguel continues with the same regularity. Unfortunately, the length of the ore is not sufficient to enable us to obtain a large extraction, otherwise the width and quality of the ore would make the lode payable.—Cross-Cut in San Miguel North Level: On the whole, I consider this cross-cut very promising; we may have to drive to 4 varas (8 to 11 ft.) more before we intersect the south-eastern cross-cut lodes, but the mineralised condition of the horse or country renders it probable that we shall find the lodes productive. The extraction for fortnight amounts to 40½ cargas (about 6 tons).

CAPE COPPER.—The Ookiep Mine report is received. It shows no material change from the last.—Returns for March: From Ookiep, 970 tons of 31 per cent.—Bill of Lading Received: 570 tons of ore per Ocean King.—Arrivals at Swansea: The Isabella and Lynwood.—Sale of Ore by Public Tender: On May 8, 490 tons, at an average of 11s. 10d. per unit, realising approximately 9700*l.*—Put Forward for Sale: By public tender on 22nd instant 490 tons.

RHENISH CONSOLIDATED.—Captain Sweet, May 11: The ground in the 90 metre level cross cut is still a fine-grained sandstone, and free from beds of schiefer, but as we approach nearer the lode more veins of ore are found crossing the end. The driving south on the eastern part of the lode in the 70 will afford 8 cwts. per metre, and looking well for improving. The driving north on the western part of the main lode will afford 9 cwts. per metre; at this point we have but two men, but we think it advisable to put on two others. The stopes in the roof of this level will afford 20 cwts. per metre. The cross-cut making from the shaft towards the Rosebud lode is being pushed rapidly on, but no vein has yet been intersected. The driving north on the supposed new lode in the 50 is spotted with ore, but not so good as it has been. The stope on the Rosebud lode will afford 10 cwts. per metre. The stope on the side lode will afford 10 cwts. per metre, and a stope near the south end, on the main lode, will afford 8 cwts. per metre.

VIRNEBERG.—R. K. Roskilley, May 15: Setting Report: Hadley Engine-Shaft: The 140 metre cross-cut to drive east through the lode, by six men, at 60 marks per metre: the lode here is very wide, and yielding fine stones of copper ore—a promising lode. To stope the back of this level, south of shaft, by six men, at 30 marks per metre; the lode is worth for copper ore 10*l.* per fathom. The 120 to drive south of shaft, by six men, at 60 marks per metre; the lode in this end is improved for copper ore, and worth 30*l.* per fathom. To stope the back of the level, by six men, at 45 marks per metre, lode worth 10*l.* per fathom. To stope the back of this level, on the footwall of the lode, by six men, at 45 marks per metre, lode worth 7*l.* per fathom. To stope the back of this level, north of shaft, by six men, at 27 marks per metre: the lode is worth 10*l.* per fathom for copper and blende. We have communicated the rise in back of the 100 with the 90, south of shaft, and we are now clearing and securing the 90 cross-cut, east of same, in order to reach the footwall of the lode, where a good course of copper ore is said to be still standing. We have already raised from this point some beautiful copper ore, and from the character of the lode generally we have reason to expect good results on attaining the footwall of same. To stope the back of the 90 metre level, north of rise and north of engine-shaft, by six men, at 16 marks per metre, lode worth 15*l.* per fathom. I am much pleased to say we have commenced building the dressing works, and good progress is being made. The dressing of copper ore is being pushed on with energy, and we are making excellent progress towards getting another parcel for the market.

MINER'S CARTRIDGES.—Messrs. HESLOP, FRANCE, and WALTON, of Lingdale, Yorkshire, propose to make the miner's cartridge of brown paper of a suitable description, whereby it is specially adapted for the miner inserting his copper pricker to attach the ordinary "squib" to the powder after the cartridge is driven home; also in an unskilfully drilled hole, or where there may be knots, it yields more towards the shape of the hole during the process of charging, hence its superiority over all other cartridges made of harder material. It is also specially designed to suit the peculiarly shaped holes usually drilled in the Cleveland district, or any other district where blasting is similarly done, and can be made of suitable lengths for any blast the miner may require during a shift.

NEW BOILER FLUID.—It seems probable that mining interests generally are soon likely to receive great benefits from the introduction of a new boiler fluid, which not only supersedes in efficiency those previously introduced, but being free from all acids and other deleterious compounds, acts as a safe preservative of iron, not only in the boilers, but in all parts of machinery into which steam has access. This Oldham boiler fluid is being rapidly introduced, I am told, in steam navigation, as well as for land engines of every description, and will soon be likely to attain great notoriety, as promoting economy in fuel, repairs, and other important considerations.

MOTIVE-POWER ENGINES.—With a view to cheapen and simplify double cylinder engines several improvements have been proposed by Mr. F. M. TOWNSEND, of Memphis, U.S. In the first place he proposes that the two cylinders should be cast together side by side, with such a thickness of metal between them as will allow of holes being bored to receive piston valves. In this manner the cylinders, valve chests, ports, and cylinder bottoms are all cast in one piece, and can be finished by the use of turning and boring tools only. The object of the second part of the invention is also to cheapen and simplify double-cylinder engines when the two cylinders are parallel or nearly so. For the purpose he operates the valves controlling the admission and emission of steam or elastic fluid to and from such cylinders through rocking levers actuated by a single eccentric. He obtains a reversal of motion of the engine by means of a sliding sleeve controlling the position of the eccentric, which is fitted loosely on the crank or intermediate shaft. The object of the third part is to provide means for governing or regulating the speed of motive-power engines, and consists in employing three or more pumps, preferably four, operated from any desired moving part of the engine, to maintain a constant stream of liquid past a piston or like appliance. The quantity of liquid flowing past the piston is regulated by a waste-cock or its equivalent. It will be obvious that, as the quantity of liquid which can pass away by the waste-cock is constant, any variation in the speed of the pumps will act so as to give motion to the piston or its equivalent, which is connected to the slide valve, throttle valve, or other desired device for regulating the supply of fluid to the engine. If desired, the amount of water allowed to pass the waste-cock or its equivalent may be varied by the action of a centrifugal governor or like appliance

Registration of New Companies.

The following joint-stock companies have been duly registered:—

GLANDOVEY SILVER-LEAD MINING COMPANY (Limited).—Capital 20,000*l.*, in 5*l.* shares. To acquire and work mining property in the parishes of Llanycynfelin and Yseinlorcoed, Carnarvon. The subscriber (who take one share each) are—G. Shenstone, Aston, Warwickshire, edge tool manufacturer; H. W. Southall, Waterloo-street, Birmingham, solicitor; R. A. Reid, 12, Fenchurch-street, merchant; H. Lobb, Cumberland street, Liverpool, merchant; R. R. Edwards, Ann-street, Birmingham; C. Baker, Birmingham; W. Hussey, Lillenhall-road, Clapham. The directors are—Messrs. B. T. Sadler, H. Lankester, M. A. Reid, H. Lobb, and J. H. Hawkins.

WAYNE'S MERTHYR COMPANY (Limited).—Capital 100,000*l.*, in 10*l.* shares. This appears to be a reconstruction of Wayne's Merthyr Steam Coal and Iron Company (Limited), the object being to acquire and carry on the Gadby's Iron-works, in the parish of Aberdare. The first seven subscribers are—Robert Ryrie, 24, Park street, merchant; F. Rodewalde, Wimbledon-common, bank director; T. Sellar, 48, Moorgate-street, merchant; T. Gallop, 48, Moorgate-street, merchant; R. D. Peeble, 22, Old Broad-street, bank manager; M. Wickens, 21, Throgmorton-street, stockbroker; J. A. Le Boneager, Cardiff, colliery manager.

UPPER PLATE MINING AND SMELTING COMPANY (Limited).—Capital 50,000*l.*, in 10*l.* shares. To acquire land in Colorado and elsewhere for mining purposes, and to carry on business as miners and smelters. The subscribers (who take one share each) are—John Dalton, Bromley Lodge, Colchester, no occupation; L. G. Sharp, Carlisle; J. G. Jebb, Junior Naval and Military Club; R. J. Archbold, 2, New Broad-street, merchant; H. L. Cameron, 7, Great George-street, S.W., Parliamentary agent; Lord R. H. Browne, Reigate, no occupation; J. C. Harker, 8, Warnford court, stock broker. The directors are Messrs. J. Bateman, H. L. Cameron, Dr. E. Lloyd, J. G. Sharp, and Lord Browne.

ANDREW MUIR AND COMPANY (Limited).—Capital 20,000*l.*, in 5*l.* shares. To acquire the business of Messrs. Andrew Muir and Co., of Albion Works, Strangways, Manchester, engineer and tool manufacturer. The subscribers (who take one share each) are—C. W. Haydon, Dunkinfield; J. Cree, 9, Coleman-street; Andrew Muir, 5, Leicester-terrace, Lower Broughton; T. Melburn, Rushford; W. A. Cook, 38, Oxford-street, Manchester; W. Sharratt, 9, Coleman-street.

TELEPHONE CONSTRUCTION AND MAINTENANCE COMPANY (Limited).—Capital 20,000*l.*, in 1*l.* shares. To acquire the rights for Great Britain and Ireland of C. W. Harrison for improvements in connection with the telephone. The subscribers are—John Downe, Putney; G. Weaver, Montague-road, Dalston; J. P. Lythgoe, Tressellian-road, New Cross; G. Alcock, Brixton Rise; A. J. Turner, Upper Tyler street, East Greenwich; J. W. Pennwell, Camden Cottage, Camden-square; C. W. Harrison, 11, Queen Victoria-street.

TYNE ENGINE WORKS COMPANY (Limited).—Capital 35,000*l.*, in 5*l.* shares. This company, which is registered under the Industrial Societies Acts, is now converted to the joint-stock form.

UNIVERSAL SEWAGE MANUFACTURING COMPANY (Limited).—Capital 10,000*l.*, in 5*l.* shares. To manufacture manure from sewage. The subscribers are—J. H. Ridd, Wrexham, 50; W. Low, Roseneath, Wrexham, 10; J. Benal, Wrexham, 10; S. T. Reeves, Erbistock, Derbyshire; R. Davies, Bank Farm, Derbyshire, 10; A. C. Lockwood, Chester, 2; R. Chadwick, Wrexham, 2; T. Ingham, Wrexham, 10.

BUXTON CENTRAL LIME AND STONE COMPANY (Limited).—Capital 20,000*l.*, in 50*l.* shares. To acquire and work beds of limestone at Wormhill, Derbyshire, and to carry on business as quarry proprietors. The subscribers (who take 20 shares each) are—J. J. Lees, Rock's Pasture, Buxton, farmer; J. Holdworth, St. Helen's, lime merchant; W. Athurton, Disley, Cheshire, farmer; A. C. Lowe, Durston, Cheshire, farmer; G. Howarth, Bolton, hotel keeper; W. Lees, Buxton, farmer. The directors are—Messrs. J. J. Lees, J. Howarth, W. Athurton, C. H. Lowe, G. Howarth, E. Howarth, and W. Lees.

MOOR PARK SPINNING AND MANUFACTURING COMPANY (Limited).—Capital 50,000*l.*, in 100*l.* shares. To acquire and carry on cotton mills at Preston. The subscribers (who take 10 shares each) are—L. Fish, 12, Thomas street, Preston; J. Burlow, Springfield, Lancashire; T. Marsden, Preston; J. Fish, Preston; W. Livesey, Preston; J. Hampson, Croston, Lancashire; D. Sharp, Preston; Joseph Woods, Preston.

LONDON MEAT IMPORTATION AND STORAGE COMPANY (Limited).—Capital 100,100*l.*, in 10*l.* and 1*l.* shares. To carry on business as meat and poultry importers, and with that object to acquire the interest of Mr. D. Tallerman in certain wharves and premises in Thames-street. The subscribers (who take one share each) are—D. Tallerman, 40, Beresford-road, Highbury; J. Burkitt, Metropolitan Meat Market; H. G. Lawson, Shoreham Lodge, Sussex; J. W. Clarke, 16, Beaufort Gardens; J. Ogle, Pall Mall; F. Manley, 245, City-road; A. D. Durham, 28, Queen square.

ASCROFT, ROBINSON, WILSON, AND COMPANY (Limited).—Capital 20,000*l.*, in 1*l.* shares. To acquire the business of Mr. George Ascroft, of Liverpool, timber merchant, and to merge it with that of Mr. H. E. Robinson, timber merchant. The subscribers (who take one each) are—George Ascroft, Townend, Lancashire; H. A. Robinson, 8, Dingle-street, Liverpool; J. Wilson, 8, Marshlane, Bootle; J. Hartley, 49, Burscough-street, Ormskirk; G. Evans, Ormskirk; C. Turton, Derby-road, Liverpool; E. H. Robinson, Dingle-lane, Liverpool.

THE ALMADA AND TIRITO CONSOLIDATED SILVER MINING COMPANY (LIMITED).

TIRITO.—Capt. W. Clemo, March 8: The stope in the first lode above the tunnel level is for the present idle, as it is not producing so well as it did. Our drive east, on south wall of south slide, has now struck the attle on the side of the old stope. I think we shall get into the level in about two weeks more. We have a little air coming through the attle in the side of the level.

PROVIDENCIA.—The underhand stope has no change worthy of reporting. The stope in the back in this place has nothing new to report.

LA VIRGEN.—At the tunnel level the end driving north continues to look well. The south end is unproductive, and is now idle. The rise in this place is looking favourable, and producing some very good black ore. We have now found the Virgen wall in the north end of the 10 fm. level, and have now commenced a cross-cut to prove it at this point. The cross-cut shows some stones of very fair ore.

MINA GRANDE.—The rise in the west branch is now 25 ft. above the tunnel level. It has got into the same dirty ground that we got in the drive in the 7 fathom level, so we have stopped it. We have now begun to sink a winze below the tunnel level. The winze is turning out well.—12 fm. level (east branch): The drive north from end of winze has no change from last week.

TIRITO.—March 15: Our drive east on south wall of south slide has no change yet to report.

PROVIDENCIA.—The underhand stope is not producing as well as it did. The stope in the back in this place has considerably decreased in value in the past week.

LA VIRGEN.—At the tunnel level the end driving north is not looking so well as it did, but is still turning out some fair black ore. The rise in this place is now stopped, and the stope commenced, and producing very fairly. The cross-cut driven in the Virgen in the 10 fm. level appears to have passed through the orey part of the lode, which is about 3 ft. wide, of very good ore (but it has not found the east or footwall of the lode). We have now stopped the cross-cut and began to drive south in the ore.

MINA GRANDE.—West Branch: The winze sinking below the tunnel level is looking well.—East Branch: In the 12 the drive north from end of winze has slightly improved since last week. It appears to be forming a wall on the west side, which is keeping hard off to the west of north, as if it were shaping itself to form like the main bunch worked in the levels above.

TIRITO.—March 22: Our drive east on the south wall of the south side, has now fairly holed to the old south level. We have now begun to drive the old end towards the Soledad. We have also begun to draw the attle from the south end of the old stull for ventilation, and are getting out a little ore.—Providencia: The underhand stope continues to look poor. The stope in the back, in this place, has slightly improved since last reported on.—La Virgen: In the Tunnel level the end driving north is now suspended for awhile, and we have put the men to cross-cut about 60 ft. further north. In this cross-cut we have now touched the hanging-wall of the lode. The stope in the back is producing a good quantity of fair quality ore. The lode in the end in the 10, driving south, appears to be rather pinched at this place, but still is producing fairly, and is a paying lode; but I think, judging from our work above, that the ore has a northerly dip. Therefore, we must drive further north in the deeper levels to get the best of the lode.—Mina Grande: In the west branch the winze sinking below the tunnel is 25 ft. deep, and has now been communicated with the south end of the old Mina Grande stope. In the 12 the east branch, driving north from the end of the winze, continues to improve in quantity and quality.

TIRITO.—March 29: The drive south-east towards the Soledad progresses at the rate of 10 ft. per week, but we have nothing more to report. We are still getting a little ore out of the old stull behind this end.

PROVIDENCIA.—The underhand stope has not improved since last week. The stope in the back of this place appears to be improving slowly.

LA VIRGEN at the tunnel level. The cross cut driven into this lode is now stopped, having cut into an unproductive part of the lode. The stope in the back of the lode continues to produce very fairly.

The end driving south, in the 10 fm. level, appears to be slightly improving. We have this week started to drive north in this level. The end is not yet very productive, but gives some good stones of ore.—Mina Grande: East Branch: In the 12 the drive north from the end of the winze has now been driven 24 ft.; the lode is now looking well—I think better in quality than I have seen it before below the 12. We have now stopped it, and begun to sink a winze in the north end of the 12, as we can extract the ore much cheaper this way than from our old winze, as we shall not have so much water to contend with, and the lode appears to be dipping northward. The lode in the north winze is looking well. We have fixed a pump in the old or south winze, as I think by this we shall be able to sink the north winze nearly dry.

TIRITO.—April 5: The drive south-east towards the Soledad continues to make good headway. We have now struck a wall on the east side of the drive, which I think may be the hanging wall of the Virgen lode. The ground driven in the past week is 8 ft. We have now commenced a stope in the extreme south end of the old south workings at the tunnel level. This is the best stope in the mine—in fact, worth more than all the rest of the green ore works in the mine put together.

PROVIDENCIA.—The underhand stope continues the same as when last reported on. The stope in the back in this place has no change since last week.

LA VIRGEN.—Tunnel Level: The stope in the back is now idle for awhile, as we have sufficient black ore broke for the time. We have now commenced to sink a winze below the tunnel level to prove and open up this ground for stopes below; this winze is turning out well. The ends driving north and south in the 10 are also suspended, as we shall prove and open up this ground also, with the winze sinking from the tunnel level.

MINA GRANDE.—In the past week we have resumed the sinking of an old winze in the tunnel level north, about midway between the Balvanera shaft and the Dios Padre boundary (by reference to the plan you will see these workings nearly in front of the San José shaft, by which name it is still known). In this winze we have a branch of very good ore, but it is very small, but I think it is worthy of a trial. The winze sinking in the north end of the 12, east branch, is not looking so well as it did. It has now got on to a ball of felspar, but this can only be a ball, as we know from the end, 20 ft. below, the ore exists nearly up to this point, therefore I hope to get through it quickly.

Frank W. Breach, March 8.—La Virgen: The cross-cut east in the extreme north end of the 10 I let, as anticipated, on Saturday last. The Virgen branch is now cut, carrying the same well-defined hanging-wall as on the tunnel level. The ore is of the same class as above, but the lede is poor here, as it is in our south drive on tunnel level, where we expected it to be so as it approached the north end of our old works. We shall drive the 10 cross-cut north with every reason to hope to meet with the same quantity of ore we have in the tunnel level; the lode yields two classes of export ores, which I have had assayed this week, and clean stones gave as follows:—Ordinary black ore, $89·60 per ton, 25 per cent. copper; black petangue, $955·73 per ton, and 52 per cent. copper. Of course the above were clean stones, but allowing for some gangue, and 50 lbs. of petangue per ton among the export ore, I think we may rely on shipping ore worth 100 ozs. per ton for silver, and 15 to 20 per cent. copper, as it is an ore capable of being cleaned by hand, being either ore very solid or spar. The two are not intimately mixed, as in the Mina Grande; the amount of lead and zinc in the ore is very small, and for that reason it should realise full prices. The second class ore, worth about $40 per ton, should be a good assistance to the furnace produce. The Providencia continues to turn out good ore over the tunnel, but is so mixed with spar that the profit on working is very small; as long as it clears expenses even barely I would keep the stope working, as it is always exploring, and a small bunch of ore, if discovered, would yield a handsome return. I had an assay made of a cleaned ball of green ore that makes in the stope, and wears out every few days, that yielded $466 per ton. Sometimes we have the ore in streaks 10 or 12 ft. long, and from a few inches to a foot in width; at other times only in spots, so that a large amount of ground has to be broken for a small return.

TIRITO.—South of the slide the ground driven last week was 21 ft. 3 in., and we holed to our old works, and obtained ventilation, as expected. We now want to reach the extreme south end to commence a south-west cross-cut, as explained in my letter of Feb. 15.

PROVIDENCIA.—March 15: You will note a change for the worse in the green ore workings in the Providencia Mine mentioned in Capt. Clemo's letter.

MINA GRANDE.—The 12 winze at last gives hope of an improvement in the north drive from it, which I hope may prove lasting.

VIRGEN.—The 10 cross cut looks very well, the ore is very solid and hard, which delays opening out for stoping as quickly as I should like. The end north on tunnel level I see is poorer than when I saw it on Saturday, but I have no fear of its continuance. In the south east end south of slide in the Tirito I hope next week to be in our extreme south-east old works, and we shall then determine whether to drive out from there south-west, or follow your advice, which had we resources at command I would not hesitate to do, and drive under the Soledad.

TIRITO.—March 22: As anticipated in my letter last week, we have communicated with the south end of our old works, and are now driving the end towards the Soledad as requested in your letter already acknowledged. Allowing for underlay of the wall in the Soledad, we have now only 10 fms. to drive, and if the ground gets no harder than at present we hope to be there in from eight to nine weeks. We are now drawing the attle from the old south works for the double purpose of ventilation and getting the metal (ore) it contains, and hope to pay the expenses of the cross cut out of it. I am glad to report that the Virgen works still continue very promising, and yield sufficient ore to more than supply the furnace. The Mina Grande also improves considerably as we drive north from the winze below the 12 fm. level.

TIRITO.—March 29: As you advised in your letter of Feb. 2, we are continuing the old south works, which, in fact, are a continuation of the tunnel towards the Soledad. On the 27th I dialled to the south end, and find we are within 10 fms. of the Soledad. The ground gets easier as we drive, and you will note by Clemo's letter, enclosed, that we are advancing 10 ft. per week. We believe we are driving on the same wall as the one visible in the Soledad old works.

MINA GRANDE.—Finding on Saturday last that the end driving north from the 12 winze was in solid ore, and widening to the north, we stopped the end in favour of sinking in the ore at the north end of the 12, for the reason that the ore appears to the north and widening out to the west. Should this prove so we shall make an endeavour to manage without driving the 24, and thus save the expense, which would be heavy. We find that from a depth of 10 or 12 fms. we can with Indian labour raise ore cheaper than by employing steam-power, and on sinking to the 24 we could stope away the ore, and continue the winze at the same time for another 12 fms. before driving a cross-cut from the shaft. The water we can manage with a winze pump.

VIRGEN.—We have cross-cut this lode north of our stopes, and found it poor. The lode holds its course, and should be again cross cut from one of the eastern cross-cuts north of the Providencia shaft, but on account of the scarcity of docile ore I hesitate to incur the expense.

April 5: You will note by Capt. Clemo's letter we have commenced a winze on a little ore near the San José cross cut in the Mina Grande. The ore is docile black ore and lead ore—and as long as it clears expenses we shall continue exploring in the hope of its leading to better.

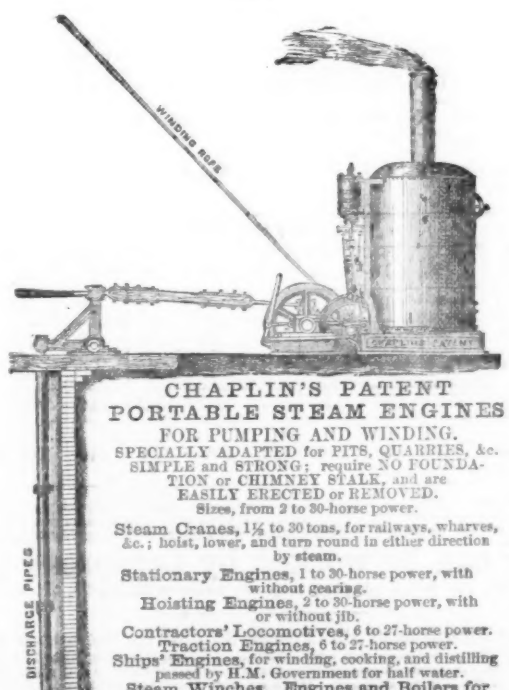
VIRGEN.—The new stope in the south is on the north side of the slide, and, in fact, is really a continuation of the old workings, as shown on the plan and section of the Tirito Mine. At this point the slide bends to the south, so that while we are driving now on the east side of it we believe we may also be on the same wall as we see in the Soledad old works. The plan will show this very clearly. The wall Clemo mentions I have not yet seen, but we have supposed that the Soledad and Virgen lodes are one, and the composition of the wall is precisely similar to that of the latter, rather confirming that belief. The wall is a felspathic silt, with diorite mixed with grains of felspar on either side. In the other parts of the mine there is no change.

The directors have also received the following telegram from Mr. Breach, dated April 24:—"Drought causes scarcity of water in reduction works. Exploration stopped for (want of) means. Mine improving."

"PRINCE BISMARCK, FRIEND OR FOE?"—The title of this pamphlet* is well chosen. Prince Bismarck is in all men's mouths, and the question as to whether he is friend or foe must be an anxious one to every European nation. We are not surprised that this brochure should be in its second thousand. Of its literary merits nothing need be said. It is by the author of "German Home Life." It advocates for the first time publicly an alliance between England and Germany. It does so on the largest ground. The only possible rivalries between the two nations, says its author, "are the fruitful rivalries of peace." The whole tone is dignified, earnest, and convincing. Every man interested in the well being of this country would do well to study its comprehensive pages. To the statesman, the manufacturer, the commercialist, and the philosopher alike it must prove equally interesting. The Army and Navy might with advantage lay it to heart; in fact, there is no section of civilised society to which it does not, in its far-sighted policy, appeal.—[* "Prince Bismarck, Friend or Foe?" Second Thousand. By the author of "German Home Life." W. Ridgway, 169, Piccadilly.]

HOLLOWAY'S OINTMENT AND PILLS—RELIABLE REMEDIES.—In wounds, bruises, sprains, glandular swellings, enlarged veins, neuralgic pains and rheumatism, the application of this soothing ointment to the affected parts not only gives the greatest ease, but likewise cures the complaint. The pills much assist in banishing the tendency to rheumatism and similar painful disorders, whilst the ointment cures the local ailment. The pills remove the constitutional disturbance and regulate every impaired function of every organ throughout the human body. The cure is neither temporary nor superficial but permanent and complete, and the disease rarely recurs, so perfect has been the purification performed by these searching yet harmless preparations.

Prize Medal—International Exhibition, 1862.



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PORTABLE STEAM ENGINES
FOR PUMPING AND WINDING.
SPECIALLY ADAPTED for PITS, QUARRIES, &c.
SIMPLE and STRONG; require NO FOUNDATION or CHIMNEY STALK, and are EASILY ERECTED or REMOVED.
Sizes, from 2 to 30-horse power.

Steam Cranes, 1½ to 30 tons, for railways, wharves, &c.; hoist, lower, and turn round in either direction by steam.
Stationary Engines, 1 to 30-horse power, with without gearing.
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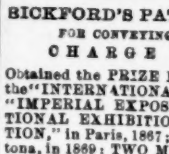

BICKFORD, SMITH AND CO., of TUCKINGMILL, CORNWALL; ADELPHI BANK CHAMBERS, SOUTH JOHN-STREET, LIVERPOOL; and 85, GRACECHURCH-STREET, LONDON, E.C., MANUFACTURERS AND ORIGINAL PATENTEES of SAFETY-FUSE, having been informed that the name of their firm has been attached to fuse not of their manufacture, beg to call the attention of the trade and public to the following announcement:—
EVERY COIL of FUSE MANUFACTURED by them has TWO SEPARATE THREADS PASSING THROUGH the COLUMN of GUNPOWDER, and BICKFORD, SMITH, AND CO. CLAIM SUCH TWO SEPARATE THREADS as THEIR TRADE MARK.

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BLASTING FUSE FOR MINING AND ENGINEERING PURPOSES,
Suitable for wet or dry ground, and effective in Tropical or Polar Climates.
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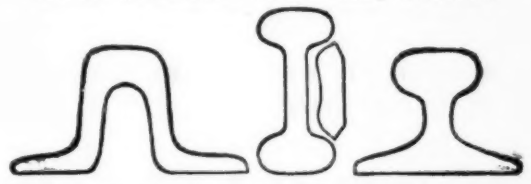

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Holman's Patent Self-acting Exhaust Steam Condensers.

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After eight years of successful application for all purposes to which steam-driven pumps can be applied, THE "SPECIAL" STEAM PUMP STILL MAINTAINS THE FIRST POSITION IN THE MARKET, notwithstanding that it alone—of all direct-acting pumps—has been subjected to the great variety of severe tests that must be encountered in such a period of time. Some valuable improvements have been suggested in the course of a long experience, and their adoption has rendered the apparatus at once the simplest and most certain in action. There is absolutely no extraneous gear, and the steam cylinder is *no longer than the pump*. The valves are of easy access, and are suited for pumping fluids and semi-fluids of almost any consistency.

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TURNS WASTE STEAM INTO GREAT POWER.

SAVES HALF ITS COST IN PIPES AND CONNECTIONS.

PREVENTS ALL ESCAPE OF STEAM IN MINES OR ELSEWHERE.

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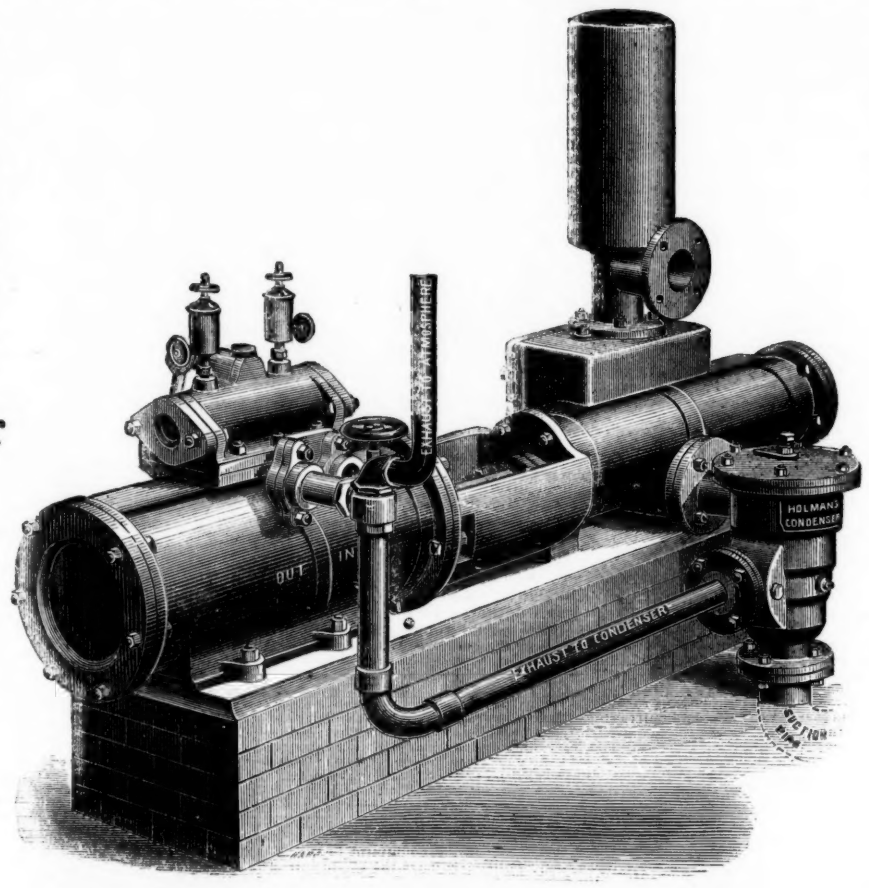
SAVES TWENTY TO FIFTY PER CENT. OF FUEL.



WILLIAM ELLIOT, Esq., *of the Weardale Iron and Coal Company, writes under date Sept. 17th, 1875, as follows:*—"We have now THIRTY-FIVE of your SPECIAL STEAM PUMPS in operation at the various collieries under my charge—some of them employed pumping water out of our pits to the depth of 50 fms.—others employed in the pits, and a good many feeding Boilers. I have no hesitation in saying that we have found them the Cheapest and Best Pumps of the kind we have tried. I can with confidence recommend them to intending purchasers."

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Are made to suit any size and kind of Steam Pump. They form a part of the suction pipe of the Pump, and while they effectually condense the exhaust steam they produce an average vacuum of 10 lbs. per square inch on the steam piston, increasing the duty of the Engine, and effecting a saving in fuel of from 20 to 50 per cent.

In Mining operations these Condensers will be of great value.

All Boiler Feeders are recommended to be fitted with these Condensers, as not only is the exhaust steam utilised in heating the feed water, but is returned with it into the boiler.

GREAT REDUCTION IN PRICES.

The following sizes are suitable for low and medium lifts:—

Diameter of Steam Cylinder ...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10
Diameter of Water Cylinder ...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	6
Length of Stroke .....In.	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	12
Gallons per hour	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,500	5070	7330
Price of Special Pump ...£	**16**	**18**	**20**	**25**	**22 10**	**27 10**	**32 10**	**25**	**30**	**35**	**40**	**30**	**35**	**40**	**45**	**50**	**40**	**45**	**50**	**55**	**65**	**50**	**55**	**60**	**70**	**85**	**55**	**60**
Extra, if fitted with Holman's Condenser and Blow-through Valve	£7	£7	£9	£11	£8 10	£11 10s	£12 10s	£9	£12	£15	£15	£10	£13	£15	£16	£22	£13	£16	£16	£22	£22	£16	£16	£23	£24	£35	£17	£17

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	16	18	18	18	18			
Diameter of Water Cylinder..In	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14			
Length of Stroke .....In	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24			
Gallons per hour	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000			
Price of Special Pump..£	**65**	**75**	**90**	**100**	**75**	**80**	**85**	**110**	**120**	**140**	**110**	**120**	**130**	**140**	**160**	**180**	**140**	**150**	**160**	**180**	**200**	**180**	**190**	**210**	**230**			
Extra, if fitted with Holman's Condenser and Blow-through Valve	£23	£24	£35	£35	£20	£27	£27	£38	£38	£50	£28	£28	£40	£40	£55	£55	£28	£40	£40	£55	£55	£45	£45	£56	£60			

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each set of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

The "Special" Steam Pump can be worked by Compressed Air as well as by Steam.

HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36 48 and 72-inch Strokes

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GENTLEMEN,—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the strict economical sense, a most valuable feature in the drainage of underground workings. The perfect manner in which this important result is accomplished by your Condenser is extremely creditable to you, and merits the thanks and commendation of the Mining Engineer. When we start the "Special" Steam Pump the Condenser commences working automatically, and maintains a constant vacuum of 10¾ lbs. per square inch, even when we run the Pump upwards of 80 strokes (106 feet) per minute. It may perhaps be interesting to you to know that when we were running the Pump at 84 strokes (168 feet) per minute, the steam gauge indicating a steam pressure of 36 lbs. per square inch, 80 yards from the Pump and the Condenser vacuum gauge on the exhaust pipe indicating a steady vacuum of 21½ inches, I turned the exhaust steam from the Condenser into the atmosphere, when the speed at once fell to 44 strokes per minute. The working economy thus shown is really so great that the cost of the Condenser must be saved in a very short time. (Signed) J. THOMPSON.

NORTH OF ENGLAND HOUSE ... ... TANGYE BROTHERS AND RAKE, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.
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Drive your Shafting with Rodgers's Patent Wrought Iron Drums, instead of Gearing.

MANY THOUSANDS IN USE.

ADVANTAGES.

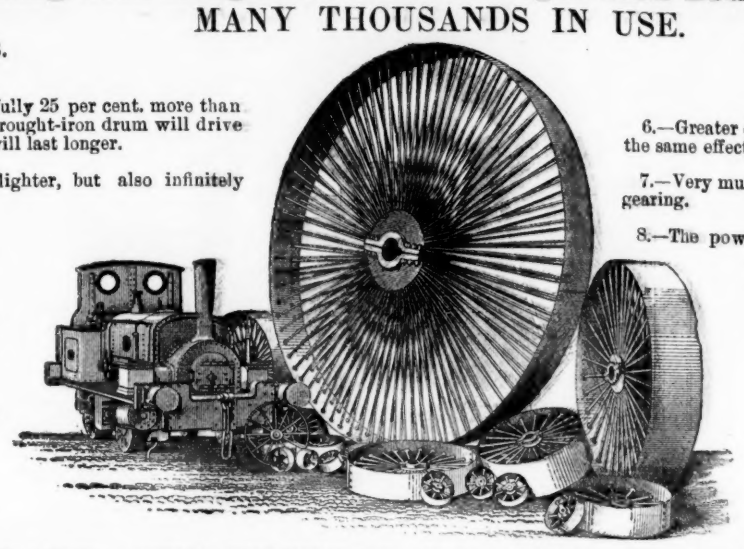
1.—Leather belts on these drums will drive fully 25 per cent. more than on cast-iron ones—viz., a 6 in. wide belt on a wrought-iron drum will drive as much as an 8 in. belt on a cast-iron one, and will last longer.

2.—These drums are not only considerably lighter, but also infinitely stronger than cast-iron ones.

3.—In case of damage from Fire they easily repaired. We have repaired hundreds at a small cost.

4.—For MAIN DRIVING purposes they are invaluable, especially in case of a new mill, no expensive ashlar work being required to withstand the jars of costly gearing.

5.—The wrought-iron drums and belts cost less and are more easily fixed than gearing.



ADVANTAGES.

6.—Greater economy in steam power, as it requires less power to transmit the same effective force with belts than it does with gearing.

7.—Very much greater economy in subsequent repairs as compared with gearing.

8.—The power is transmitted evenly, faithfully, noiselessly, and without the jar arising from defective or worn gearing.

9.—They require no cases for transport or shipment.

They can be supplied up to

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PATENTED IN

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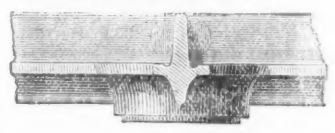
ARE STRONGER, SUPERIOR, AND CHEAPER THAN ANY OTHER METAL SASHES YET PRODUCED—COST LESS FOR GLAZING—ARE AS CHEAP IN MANY CASES AS WOOD



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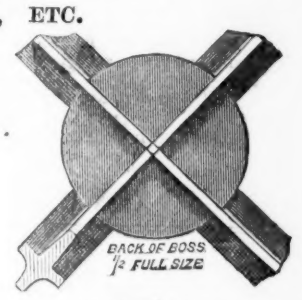
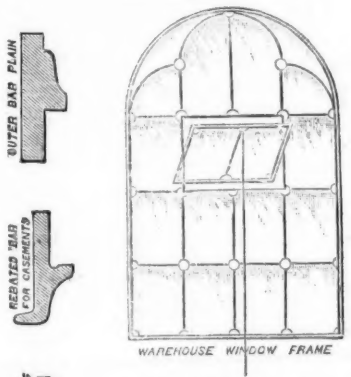
—CAN BE DESIGNED AND MANUFACTURED TO SUIT ANY STYLE OF ARCHITECTURE OR POSITION WHERE A WINDOW MAY BE REQUIRED.

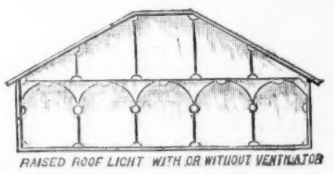


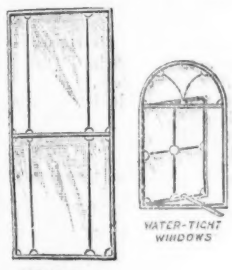
ARE BEING EXTENSIVELY USED IN—

Private Houses,
Parsonage Houses,
Farm Houses,
Churches,
Chapels,
Schools,

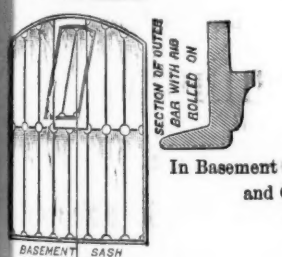


Lunatic Asylums, &c.,
Public Buildings, Banks,
Wharves, Warehouses,
Factories, Mills,
Breweries, &c.,
Engine Houses.

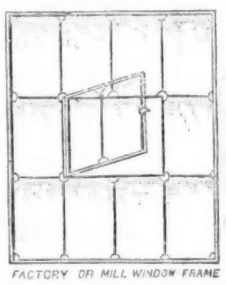




ILLUSTRATED CATALOGUES ON APPLICATION.

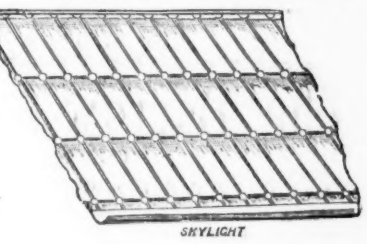


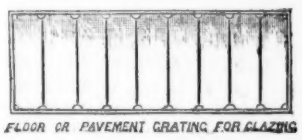
In Basement Storeys and Exposed Positions Shutters and Guard Bars are dispensed with.



ILLUSTRATED CATALOGUES ON APPLICATION.

Security is obtained in these Skylights without Guard Bars, and with less obstruction to Light.





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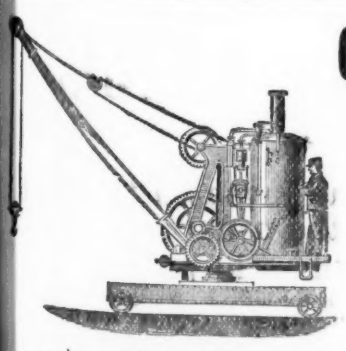

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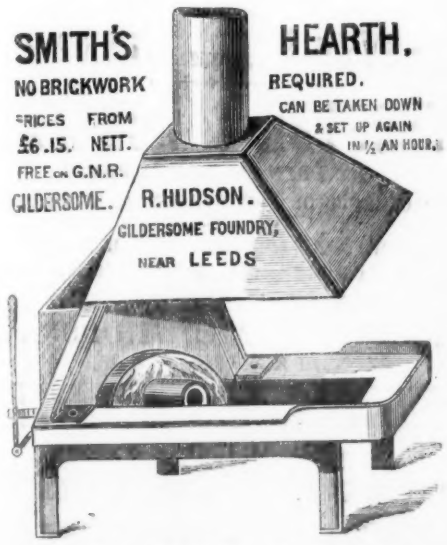

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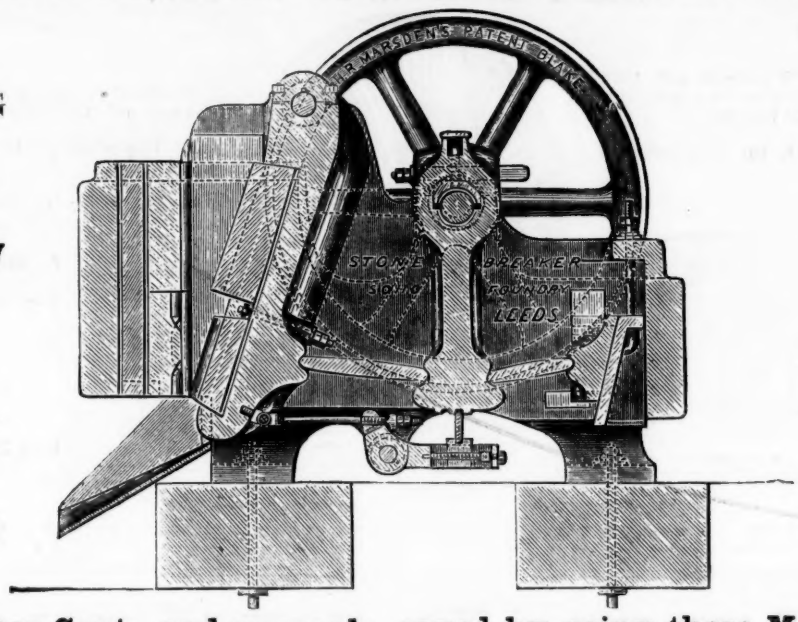

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